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Analysis of the antecedents of knowledge sharing and its implication for SMEs internationalization

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Abstract

Knowledge is an essential organizational resource that provides a sustainable competitive advantage in a highly competitive and dynamic economy. SMEs must therefore consider how to promote the sharing of knowledge and expertise between experts who possess it and novices who need to know. Thus, they need to emphaisze and more effectively exploit knowledge-based resources that already exist within the firm. A key issue for the failure of any KM initiative to facilitate knowledge sharing is the lack of consideration of how the organizational and interpersonal context as well as individual characteristics influence knowledge sharing behaviors. Due to the potential benefits that could be realized from knowledge sharing, this study focused on knowledge sharing as one fundamental knowledge-centered activity. Based on the review of previous literature regarding knowledge sharing within and across firms, this study infer that knowledge sharing in a workplace can be influenced by the organizational, individual-level and technological factors. This study proposes a conceptual model of knowledge sharing within a broad KM framework as an indispensable tool for SMEs internationalization.

The model was assessed by using data gathered from employees and managers of twenty-five (25) different SMEs in Norway. The proposed model of knowledge sharing argues that knowledge sharing is influenced by the organizational, individual-level and technological factors. The study also found mediated effect between the organizational factors as well as between the technological factor and knowledge sharing behavior (i.e., being mediated by the individual-level factors). The test results were statistically significant. The organizational factors were acknowledged to have a highly significant role in ensuring that knowledge sharing takes place in the workplace, although the remaining factors play a critical in the knowledge sharing process. For instance, the technological factor may effectively help in creating, storing and distributing explicit knowledge in an accessible and expeditious manner. The implications of the empirical findings are also provided in this study.

Keywords: knowledge, sharing knowledge, KM, organizational, individual-level and technological factors, internationationalization, SMEs

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Chapter one

Introduction

1.0 Overview

This chapter presents the introduction of the study. It includes background of the study, statement of the problem, objectives and significance of the study as well as research questions. Chapter organization is also included in this chapter.

1.1 Background of the study

The interplay of rapid development of information and communication technology, trade liberalization and globalization provide opportunities for Small and Medium-Sized Enterprises (SMEs) to expand their operations into international markets. Undeniably, SMEs play an increasingly active role in foreign markets in recent times. Thus, they are rapidly expanding their operations to foreign markets, through international diversification as an essential strategic option to achieve their growth potentials (see Mohibul and Fernandez, 2008). Firms' internationalization can be an essential strategy for both small and big firms to grow and gain experiential knowledge (see Zahra et al., 2000). In addition to the growth and learning outcomes (i.e., gaining experiential knowledge), international involvement of SMEs provides them the opportunity to enhance their financial performance and also, contribute significantly to the global market (see Lu and Beamish, 2001).

SMEs are considered the core foundation of growth and form a large part of the private sector in today's global economy (Aurelie, 2014). These enterprises provide the required driving force for economic modernization, innovation and growth as well as stimulate the economic development of most countries (OECD, 2009; Giovannini et al., 2005). Given the significant contributions of SMEs in the local and international markets, it is not surprising that the internationalization process of SMEs has become such an important subject of debate in academic studies, to scholars and policy makers in recent times (see, for e.g., Madsen and Servais 1997; Forsgren 2002; Andersson, 2004; Saarenketo et al., 2004; Johanson and Valhlne, 2009; Lin, 2010). For the purpose of this study, the category of SMEs is made up of firms which employs fewer than 250

people and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro (see European Commission, 2005).

SMEs contribution to economic growth, job creation and economic and social cohesion makes the study of the internationalization of SMEs very popular among scholars, researchers and policy makers. These scholars and researchers view the internationalization process of SMEs from various perspectives. For example, some studies focused on the process of internationalization (see, for e.g., Dib et al., 2010; Prange and Verdier, 2011), others looked at factors of internationalization (see, for e.g., Evers, 2010; Hutchinson et al., 2007), as well as barriers to internationalization (see, for e.g., Shaw and Darroch, 2004; Arranz and De Arroyabe, 2009) among others. The current dominant internationalization theories suggest that incremental learning accounts for the rapidity and the extensiveness of firms' internationalization. As a consequence, knowledge and capabilities are recognized as the essential drivers for the internationalization of SMEs (see Yli-Renko, Autio and Tontti, 2002). In light of this, Saarenketo et al. (2008) argued that dynamic capabilities and knowledge resources have important implications for the internationalization of SMEs especially in this post-modern era, where SMEs do not operate only within their local countries.

Over the past few decades, different scholars and researchers have proposed different theories and models to explain what the internationalization process of firms is in practice and how knowledge resources help firms in the internationalization process (see, for e.g., Welch and Luostarinen, 1988; Johanson and Vahlne, 1997; Saarenketo et al., 2004; Nordman and Melen, 2008). Although many attempts have been made to synthesize the literature on internationalization of firms, a common acceptable framework for the interpretation of internationalization is not yet available (see Saarenketo et al., 2004). In addition, the internationalization behavior of individual firms is peculiar and is not being explained by the existing frameworks (see Reid, 1983). For the purpose of this study, knowledge resources and capabilities relate to the knowledge, expertise, skill, technical know-how, experience, technology, market and product information as well as the measure of the ability of an entity (such as a firm, department, system or person) to achieve a set objective.

The internationalization process of SMEs has been widely studied by researchers and scholars in the past few years. These scholars and researchers have attempted to use theories and models to explain the internationalization process of firms, including SMEs. However, these theories and models look at the internationalization process of firms from different perspectives. This therefore creates the need for an integration of theories and/or models to provide a more holistic approach to the interpretation of the internationalization process of firms. Meanwhile, there is recognition and a common view among scholars and researchers that knowledge resources and capabilities are necessary for the internationalization of SMEs (see for e.g. Yli-Renko et al., 2002; Wiklund and Shepherd, 2003; Saarenketo et al., 2004). This is partially due to the fact that SMEs are not fully equipped with the much-needed tangible assets, their small size and limited financial scope (Wiklund and Shepherd, 2003). Intangible resources such as knowledge have therefore become very important for SMEs to help them gain competitive advantage in the dynamic international business environment (see, for e.g., Kogut and Zander, 1992; Grant, 1996). This makes knowledge and its management an indispensable tool for the successful internationalization of SMEs.

According to Saarenketo et al. (2004), most of the earlier studies conducted related to internationalization of large manufacturing firms. The studies also focused on high-technology firms which are often characterized as 'born global' firms. The 'born global' firms have received a lot of attention from scholars and researchers concerned with internationalization of firms. The main reason for such attention has been attributed to the firms' rapid and intensive international expansion, mostly with the aid of external resources such as networks and partners (Saarenketo et al., 2004). More studies are now being extended to smaller and service-intensive firms. Some researchers have argued that the established internationalization theories are not comprehensive enough to independently explain the internationalization process of such firms (see, for e.g. Bell, 1995; Coviello and McAuley, 1999). This therefore creates the need for the development, reformulation and extension of theories that provide a single commonly accepted interpretation of the internationalization process of firms being it small, big, or high-tech based. This is evident in the argument put forward by Andersen (1993) that, many attempts made by researchers and scholars to synthesize the internationalization literature to come up with a generally accepted interpretation of internationalization of firms has not been successful.

The theories and models proposed to explain the internalization process of firms have only highlighted on some facets of internationalization and are therefore most likely to provide an incomplete explanation for a firm's internationalization (see Mejri and Umemoto, 2010). For example, the Uppsala model focuses on experiential knowledge and the 'born global' theory emphasizes on technological knowledge and knowledge intensity for a firm's international success. Similarly, the resource-based approach emphasizes on the valuable, rare and imitable resources of a firm to gain sustainable competitive advantage needed for international success. The attempts to explain and clarify the complexity of the internationalization phenomenon using a holistic approach has already commenced, but there is still a need for the integration of existing theories and model to comprehensively interpret the phenomenon (see Etemad, 2004). Thus, a lot of studies are needed to synthesize the existing literature and provide a clear and full picture as well as a single, commonly interpretation of internationalization of firms from a broader perspective.

Knowledge is considered to be a key factor for achieving competitive advantage and sustained organizational success in a competitive and dynamic economy (see, for e.g., Grant, 1996; Cabrera et al., 2006). Yet, while the importance of knowledge for organizational success (or survival) is widely recognized, there is still an unclear understanding about how to manage it towards accomplishing this end (see Handzic et al., 2004). Knowledge management (KM) is an emerging field of study and practice that seek to help businesses, organizations and governments manage and orchestrate their knowledge entities in a manner that they are able to achieve a sustained competitive advantage. Although a firm's knowledge resource is considered a key indicator of its internationalization, the dynamic facets of knowledge development and exchange have not received enough attention in the previous empirical studies (see Saarenketo et al., 2004). In light of this, it is necessary for SMes to develop a KM framework which focuses on the capturing, developing, sharing and the effective utilization of their knowledge resources and capabilities.

It is worth noting that, a great deal of knowledge within firms resides in the minds of its employees. Thus, to capitalize on individual knowledge, firms need to turn it into organizational knowledge (see Handzic et al., 2004). KM is important for firms, especially SMEs in their internationalization process because it is a key factor that enables them to achieve and sustain

competitive advantage in a dynamic business environment (see Kankanhalli et al., 2005). Additionally, KM provides an avenue for intangible resources such as knowledge and capabilities to be shared which is a major source of learning in firms. Learning has therefore become crucial for international success (Saarenketo et al., 2004). Thus, it is new knowledge that drives the growth and success of firms (see Penrose, 1959). For example, sustainable competitive advantage can occur when a firm acquires or develops an attribute or a set of attributes, such as access to skilled human resources whose expertise are difficult to imitate and allows it to outperform its competitors.

There is a consensus among many scholars that the success of KM initiatives depends on knowledge sharing (see Wang and Noe, 2010). Thus, knowledge sharing is viewed as a necessary and a sufficient element of KM for firms to effectively exploit knowledge-based resources that already exist within the organization (see, for e.g., Spender and Grant, 1996; Damodaran and Olphert, 2000). This implies that it is not enough for firms to possess specific knowledge, skills, competence or capability or help employees acquire them, but to ensure effective transfer of knowledge and expertise among employees especially to those who need to know. The potential benefits of knowledge sharing may include, but not limited to, increased sales and revenue from new products and services, significant reduction in production costs, process improvement, better team and firm performance as well as firm's innovative capability (see, for e.g., Hansen, 2002, Cummings, 2004; Arthur and Huntley, 2005; Magnus and DeChurch, 2009). Knowledge sharing is concerned with the means through which employees can contribute to knowledge exchange and application, as well as organizational knowledge and innovation, which a firm requires to achieve competitive advantage (see, Jackson, Chuang, Harden, Jiang and Joseph, 2006).

The current literature provides incomplete and misleading information on the subject matter and requires further studies to investigate how firms acquire and share knowledge resources necessary for their growth and international expansion. In addition, there is still not enough empirical evidence regarding the internationalization of SMEs from knowledge-based perspective. Thus, the understanding of the critical issues regarding this subject like the type of knowledge emphasized, source of knowledge and how this knowledge impact on the internationalization process of small firms still remains unclear (see Eriksson et al., 2000).

Furthermore, studies that focus on the key issues of KM such as how key organizational factors affect knowledge sharing ,what sources of knowledge resources and capabilities, are required for the successful internationalization of SMEs are limited in the existing literature. This study focuses on the one knowledge-centered activity, knowledge sharing to show how managing knowledge resources effectively and efficiently can lead to a successful internationalization of SMEs.

1.2 Statement of the problem

As highlighted in section 1.1, knowledge resources and capabilities are critical for SME internationalization, creating a need for a knowledge management framework for such firms to be able to exploit opportunities in the international market. The gap in literature is discussed in section 1.1. All the well-established theories of internationalization emphasized that knowledge plays a key role in the internationalization process of firms. In light of this, I am investigating how the fundamental factors affect knowledge sharing among SMEs in their internationalization process and show how managing knowledge resources effectively and efficiently can lead to a successful internationalization of SMEs. This study is important because, the key factors that affect knowledge sharing have not been explicitly tested empirically among Norwegian SMEs. In spite of the number of studies on SMEs internationalization acknowledging the significant role of knowledge, there are only a few of them that focused on knowledge management. SMEs in most cases, fail to achieve sustainable competitive advantage in the international market because they are not able to manage their knowledge resources effectively and efficiently in the internationalization process (see Rodriguez et al., 2010).

Given the significant role that knowledge resources and capabilities play in the internationalization of SMEs, it is important to investigate the research questions: what are the different sources of knowledge?; how do the key organizational, individual-level and technological factors affect knowledge sharing?; are the individual-level factors influenced by organizational and technological factors?; what are the implications of knowledge sharing to knowledge resources required for SME internationalization? The key organizational factors identified are management support, rewards/incentives, leadership characteristics and organizational culture. The individual-level factors identified include interpersonal trust,

individual attitude, perceived benefits/costs and individual self-efficacy. Finally, technological factor is also considered. In order to address the research questions, this study focuses on three main facets of knowledge sharing: (1) the extent to which an individual uses different forms of channels (e.g., informal interaction, organizational database); (2) the extent to which an individual shares different types of knowledge (e.g., personal experience, expertise, ideas); and (3) the frequency of knowledge sharing (see Wang and Noe, 2010).

1.3 Objectives of the study

The main objective of the study is to investigate and conceptualize the link between the fundamental organizational, individual-level and technological factors influencing knowledge sharing among SMEs. The study is expected to provide insights on how the key knowledge resources may be created or acquired and managed in the internationalization process of SMEs. Finally, a conceptual model is presented to show how the variables of interest (i.e., organizational, individual-level and technological factors) facilitate the process of knowledge sharing among SMEs.

1.4 Significance of the study

This study is expected to have a significant impact on SMEs' KM system, growth and internationalization. This is because a successful implementation of KM initiatives depends on knowledge sharing (see, Wang and Noe, 2010). Moreover, knowledge is a major source of competitive advantage in the global market and managing it effectively and efficiently is essential for a successful internationalization of SMEs. In addition, this study proposes a conceptual model of knowledge sharing that may help sustain SME international business growth. Thus, it is expected to be relevant to firms with international ambitions. This is important because such ambitious firms emphasize on international orientation in their hiring and training of key managerial staff.

The study is expected to help enrich the researcher's and other readers' knowledge in the field of internationalization of firms as well as KM, particularly knowledge sharing. It is said that experience in a particular field brings knowledge in that field and because a thorough research would be carried out, new discoveries are bound to be made. Finally, this study is timely and its

findings are expected to serve as the basis of a much-needed debate on the concept of knowledge management in the internationalization process of firms as well as for further research.

1.5 Research questions

The following research questions helps this study achieve its desirable objectives:

1) What are the different sources of knowledge?
2) Do organizational factors affect knowledge sharing?
3) Do individual-level factors affect knowledge sharing?
4) Does technology influence knowledge sharing?
5) Are the individual-level factors influenced by organizational and technological factors?
6) What are the implications of knowledge sharing to knowledge resources required for SME internationalization?

1.6 Chapter organization

This study will be organized in three chapters as follows:

Chapter one: This chapter focuses on the introduction of this study. It includes an overview, background of the study, a statement of the problem, objectives of the study, the significance of the study, research questions, and chapter organization.

Chapter two: This chapter deals with the theoretical framework on the topic. It reviews existing literature related to the topic.

Chapter three: This chapter deals with data and methods. It includes the population, sample size, sampling technique and data collection for this study.

Chapter four: This chapter presents the discussions and findings of this study.

Chapter five: This chapter focuses on the conclusion and implications of the study as well as suggestions for further research.

Chapter two

Review of literature

2.0 Overview

This chapter reviews the existing literature on the topic. This includes the meaning of internationalization, internationalization of SMEs, earlier theories and models of internationalization and the knowledge-based view of the firm as a starting point. It also includes the nature, classification and sources of knowledge, as well as managing knowledge resources for SMEs internationalization. Knowledge sharing as a critical success factor, and areas of focus in knowledge sharing as well as a conceptual model of knowledge sharing are further reviewed in this chapter.

2.1 Meaning of internationalization

The concept of internationalization has been well-established in literature since the last few decades and its prominence has captured the interest of scholars and researchers in strategic management, international business and entrepreneurship (see Lu and Beamish, 2001). International diversification is the main interest of researchers in strategy and international business, though the emphasis has been on large, well-established firms (see Oviatt and McDougall, 1996). For researchers in entrepreneurship, SMEs have been the primary focus, while expanding their operations to new geographic markets has essentially been regarded as an act of entrepreneurship (see, for e.g. Burgelman, 1983; Lumpkin and Dess, 1996; Barringer and Greening, 1998).

While there is no precise definition of the internationalization phenomenon, many scholars and researchers concerned with internationalization of firms have defined it, but in different ways. Calof and Beamish (1995) define internationalization as the process of increasing firms' involvement in international operations. From a network context, Lehtinen and Penttinen (1999) defined internationalization as a process of developing networks of business relationships in other countries through extension, penetration and integration. Internationalization is also viewed by Johanson and Vahlne (1990) as a cumulative process where relationships are continuously established, developed, maintained and dissolved to achieve the objectives of the firm. To Welch

and Luostarinen (1993), the term, internationalization can be defined as a process of increasing involvement of firms in international operation and this process has been understood to begin with inward operation, with a gradual and sequential movement into outward operations.

From the above definitions, it is clear that, different scholars and researchers view internationalization from a different perspective and none of the views have been generally accepted. However, internationalization process of the firm referred to in this study, can broadly be understood as a process that involves increasing involvement of firms in international markets, learning, gaining experience, building networks of relationships and utilizing the firm's resources to gain sustainable competitive advantage for a successful internationalization.

2.2 Internationalization of SMEs

In recent times, the dynamic nature of the market pushes firms in different ways to embark on internationalization. The scope of the internationalization can be diverse in the sense that, some firms may choose to internationalize certain aspects of their products or service or one or more processes such as production, distribution or sales. A firm's choice of the product/service or process to be internationalized is very critical, as it determines whether the internationalization will be successful or not (see Rodriguez et al., 2010). The internationalization of SMEs is expected to accelerate with the rapid development and improvement in information communication technology, and declining trade barriers among other factors driving the global economy to become more integrated (see Lu and Beamish, 2001). It has been established in previous literature that a sizable number of SMEs have achieved international success and their contribution to the economic growth, innovation and prosperity has become increasingly significant to the global economy (see, for e.g. Reynolds, 1997; Gjellerup, 2000). Numerous studies have been conducted to assess the role that SMEs play in driving economic growth and development in both developed and emerging economies (see Oviatt and McDougall, 1994).

Evidence suggests that SMEs are essentially driving gross domestic product (GDP) growth and sustaining employment throughout the world (see Dalberg, 2011). As a result of this contribution, SMEs has been at the core of micro-economic theory, policy formulation and academic studies in both developed and emerging economies (see Bain and Company Inc. and the Institute of International Finance, 2013). SMEs predominate among the forms of businesses

in the world business stage, thus, accounting for more than 95% of enterprises across the world and contribute to about 60% of private sector employment (see Ayyagari et al., 2011). Growth through international expansion can be an essential strategic option for both small and large firms as it normally leads to increased economic growth and reduced unemployment (see Ruzzier et al., 2006), useful learning outcomes (see Zahhra et al., 2000) and enhanced financial performance (see Lu and Beamish, 2001). The increasingly active role played by SMEs in the international market accounts for a significant development within the broad internationalization trend in recent times (see Oviatt and McDougall, 1994).

SMEs differ from other large firms in many different ways, such as resource capacity, size, mode of operation and market offering, the firm's behavior and international involvement (see Agandal, 2004). The European Commission (2013) has argued that SMEs need financial support to acquire resources, meet the required working capital and ensure adequate funding for business expansion. Unlike large firms, access to external finance and limited scarce resources pose a major challenge for the international expansion of SMEs. This however, constrains SMEs and inhibits their growth prospects. The limited tangible resource capacity of SMEs invariably makes intangible resources such as capabilities and knowledge resources indispensable for them to gain competitive advantage in the dynamic international business environment (see, for e.g., Kogut and Zander, 1992; Grant, 1996). This makes knowledge resource and its management a key factor in the successful internationalization of SMEs.

2.3 Earlier theories and models of internationalization

Over the past few decades, scholars concerned with internationalization of firms have proposed theories and models with the ultimate aim of explaining international business. The most popular theories and models of the internationalization process of firms are broadly discussed in this section. These are: the Uppsala model; the network model; the resource-based view of internationalization; and the 'born global' (BG) model; and the knowledge-based view of the firm. This study is related to the knowledge-based view of the firm and it is being used as a starting point as highlighted in section 2.4. Below is a brief discussion of the most popular theories and models for understanding how the internationalization process of firms evolved as well as the different ways scholars view the internationalization process of firms:

The Uppsala model developed by Johanson and Vahlne (1975) is a theory that explains how firms gradually extends or intensify their activities in foreign markets. The key features of this model are as follows: 1) firms usually gain experience from the domestic market before they move to foreign markets; 2) firms begin their foreign operations from geographically and culturally close countries and then, gradually move to distant countries; and 3) firms start their foreign operations through exports and foreign direct investments (see Johanson and Vahle, 1977, 1990).

According to Johanson and Mattsson (1988), the network model emphasizes on the interplay of firms' resources and activities as well as the role of actors within networks which affect the internationalization of SMEs. Thus, a strong network is considered necessary for firms to survive in the highly competitive international market. That is to say, they are able to build trust which together help them to take advantage of economies of scope and scale, reduce uncertainty as well as achieve growth potentials (see Johanson and Vahlne, 2009).

The resource-based view focuses on sustainable and inimitable attributes of a firm as the main sources of economic rents, considered as the fundamental drivers of the sustainable competitive advantage needed for superior performance in the internationalization process (see Ruzzier et al., 2006). Some scholars have proposed different attributes that resources should possess in order to sustain a long-term competitive advantage (see, for e.g., Barney, 1991; Grant, 1991; Peteraf, 1993; Mahoney and Pandian, 1997). The proposed characteristics are that resources must be valuable, rare, imperfectly imitable and not substitutable (see Barney, 1991), as well as durable, transparent, transferable, and reliable (see Grant, 1991).

Studies on 'born global' firms show early, rapid and intensive international expansion of small high-technology firms which contradicts the conventional internationalization theories which suggest that internationalization is a gradual process (see, for e.g. McKinsey and Co., 1993; Knight and Cavusgil, 1996). The term, 'born global' has been defined as "business organizations that from inception, seek to derive significant competitive advantages from the use resources and the sale of outputs in multiple countries" (see Oviatt and McDougall, 1994). Thus, 'born global' firms are characterized by early and accelerated internationalization.

2.4 Knowledge-based view of the firm as a starting point

Until recently, the resource-based view of the firm was regarded as the general framework in the field of internationalization for understanding how a firm's competitiveness can be achieved (see, for e.g. Barney, 1986; Grant, 1991; Foss, 2000). Although the resource-based view is widely accepted, it has some limitations. For example, it has argued that, the concept is vague in the sense that, it is unclear on the key resources necessary for a successful internationalization (see Williamson, 1999) and may not apply to dynamic markets where it is difficult to achieve sustainable competitive advantage (see D'Aveni, 1994). Many scholars and researchers have emphasized the significance of intangible resources such as knowledge to gain sustainable competitive advantage (see, for e.g., Kogut and Zander, 1992; Grant, 1996). The knowledge-based view of the firm is deemed to be of great importance because firms' ability to manage knowledge acquisitions in dynamic markets largely affects the international expansion of those firms. Knowledge-based resource has been found to contribute significantly to the performance of firms even in a dynamic and turbulent environment (see Miller and Shamsie, 1996).

The knowledge-based view of the firm considers knowledge as the most important resource for a firm's survival, profitability and growth in both domestic and foreign markets. While some studies focus on organizational knowledge creation (see Nonaka and Takeuchi, 1995), other research works focus on individual knowledge and knowledge application (see Grant, 1996). It has established that knowledge is embedded in and carried through several entities like organizational identity and culture, documents, routines and procedures, policies, systems, and especially employees (see, for e.g., Nelson and Winter, 1982; Grant, 1996; Spender, 1996). The mere existence of knowledge is not sufficient enough to translate into growth, but the ability to effectively apply those existing knowledge to create more knowledge is what helps firms to grow and achieve sustainable competitive advantage in the marketplace (see Alavi and Leidner, 2001). For example, the use of a firm's knowledge about foreign markets provide it the expertise to comprehensively understand consumers, competitors, develop effective business models and prepare adequately for a successful international expansion.

2.5 The nature of knowledge

The ultimate reason for the increasing interest in knowledge and its management lies in the differentiation between information and knowledge (see Kreiner, 2002). According to Meso and Smith (2000), a very popular view of business strategy today – the resource-based theory of firms – believes sustainable competitve advantage can only come strategic assets and knowledge (not information). Notice that information is capable of telling us about the changes taking place but does not make us capable of replicating those changes. Therefore, to be able to initiate changes, we must possess what makes up capable of analysing or evaluating data and information as a first step and then make informed decisions based on our evaluations. Knowledge is what gives us this capability and the main reason that it remains a key element in business success and in the competitiveness of a firm. For clarity and understanding, the differences between data, information and knowledge are summarised Davenport's taxonomy are summarised as follows:

- Data is a given fact, number or picture which represents something in the real world. Thus, it relates to simple observations of states of the world that is easily structued, often quantifiable, easily captured on machines and easily transferable. For example, real-time stock prices.

- Information is data that have meaning in context. That is, data with relevance and purpose. For data to become information, it requires unit of analysis, it needs consensus on meaning and human mediation is necessary. For instance, an Analyst's report of stock trends (i.e., either stock- uptrend or downtrend).

- Knowledge is something acquired through learning and/or experience. It is being familiar, aware and understanding something or someone. Thus, knowledge is value-added information emanating from the human mind through reflection and synthesis, including context. Unlike data, it is hard to structure, often tacit, difficult to capture on machine and hard to transfer. An example is a Fund manager's decision to sell or buy stocks (see, for e.g., Davenport and Prusak, 1997; Oye et al., 2011).

Oye et al. (2011) provides a good example of the differences between data, information and knowledge using the financial market. Financial data such as real-time stock prices of listed companies are publicly available. This is a legal requirement to ensure that all participants in the financial market have such data in a transparent manner because any party having access to additional data will have a significant advantage over the other parties. Financial experts have powerful computer models to turn the data into information, such as a particular stock price is on an uptrend and another is on a downtrend. We would expected all the experts to have similar level of performance because every expert acted on the same information. However, in the real world, we find a few financial experts such as Warren Buffet of Berkshire Hathway and Bill Miller of Legg Mason outperforming the industry average consistently over time. Such superior performance can only be attributable to the experts' knowledge, that is, their distinct experience, values and insight which were put in the interpretation of the same information available to all their competitors (i.e. other financial experts).

2.6 Classification and sources of knowledge

Knowledge has been classified in different ways by different scholars and researchers. Saarenketo et al. (2004) classified knowledge into three forms: tacit knowledge ("know-how"); fully articulated codified information ("know-that"); and generic knowledge. According to them, tacit knowledge is embedded in the firm as a whole or in a team within the firm and it is based on experience. It is easy to protect against imitation. This knowledge gives the firm the expertise to exploit economies of scale and scope. The source of this knowledge can be internal (i.e., from within the firm or employees' knowledge) and/or external (i.e. from outside of the firm by using outsourcing or networking strategies). They also described fully articulated codified information as knowledge that is a source of positive externality and is related to knowledge transfer and knowledge creation through integration. This type of knowledge is sourced externally and the absorptive capacity of the firm is critical when acquiring codified information. They described generic knowledge as a combination of the two knowledge categories explained above.

Knowledge can also be categorized into Market knowledge, experiential knowledge, network knowledge, cultural knowledge and entrepreneurial knowledge (see Merji and Umemoto 2010). They described market knowledge as objective or explicit information about foreign markets

which includes information about consumers, competitors, market size and regulations. The source of this knowledge can be internal and/or external. To them, experiential knowledge results from practice and experience. The other classes of knowledge are network knowledge (i.e., knowledge related to social and business network relationships), cultural knowledge (i.e., knowledge related to language, behavior, norms, laws, etc) and entrepreneurial knowledge (i.e., knowledge related to opportunities recognition in markets and their exploitation) as part of experiential knowledge.

Eriksson et al. (2000) further divided knowledge that firms accumulated through their exposure to market into three categories: institutional knowledge; business knowledge; and internationalization knowledge. According to them, institutional knowledge is related to information about governance structure in specific countries and rules, regulations, values of the countries and business knowledge is related to information about clients, their needs and decision making process. Internationalization knowledge is concerned with the ability of the firm to use its capabilities and resources as well as external support, for example, international alliances, partners and experts to extend their operations into foreign markets. SMEs have dexterity for exploiting external sources of knowledge due to their limited resources and inability to invest substantially to create knowledge, see Robinson 1982.

2.7 Managing knowledge resources for SMEs internationalization

In recent years, KM has become important in the global setting with focus on geographical dispersion, communication across time zones and cultural influence factors (Holden, 2002). Studies in the field of internationalization over the years have focused mainly on the role of knowledge and its contributions to the internationalization process of firms. Thus, knowledge has been described as a key predictor common to all the well-established internationalization theories (see Yli-Renko et al., 2002). The most popular internationalization theories and models considered in this study more or less assert to the fact that knowledge is an important resource for the successful internationalization of SMEs in a dynamic and turbulent business environment.

Knowledge is recognized as an asset that contributes significantly to the achievement of a firm's sustainable competitive advantage (see, for e.g., Pan and Scarbrough, 1999; Davenport et al., 1998). As a result of this, there is a need for firms to manage their existing knowledge effectively

and efficiently if they are to benefit from it. Notably, the success of SMEs can be linked to how effective and efficient they manage their existing knowledge and new knowledge (see Dollinger, 1984; Brush 1992). This makes KMa powerful tool for the internationalization of SMEs. This is because KM can help firms to: 1) leverage on their knowledge and capabilities to achieve operational efficiency; 2) achieve higher rates of innovations and better customer service; improve their aptitude to have a foresight on patterns and trends emerging in marketplaces (see Desouza and Awazu, 2006). SMEs, in particular, are expected to pay close attention to KM for several of these salient reasons.

To gain sustainable competitive advantage and create value from knowledge, firms especially SMEs need to learn how to manage their knowledge resources effectively and efficiently. The approach implemented by firms to manage knowledge is commonly referred to as KM (see Varun Grover, 2001). KM is regarded as a dynamic, constantly evolving process that includes acquiring knowledge from customers, creating new revenues from existing knowledge, capturing employees' knowledge for reuse later. In today's dynamic and turbulent business environment, KM is crucial for a firm's local and international operations. This implies that KM is an integral part of the internationalization process of SMEs. Any KM process consists of four main processes: knowledge creation; knowledge storage/retrieval; knowledge transfer/sharing; and knowledge application (see Alavi and Leidner, 2001). Knowledge creation is related to the development of new knowledge or replacing existing knowledge in terms of tacit and explicit knowledge and knowledge storage/retrieval includes activities such as knowledge residing in various component forms, knowledge coding, knowledge structure as well as store of knowledge to organizational memory devices. Knowledge transfer/sharing relates to sharing knowledge between individuals, individual to group, group to group, groups within and across firms and knowledge application is an integration of existing knowledge into a firm's processes or activities as well as using it for some useful purpose for the firm.

In today's global, digital and interconnected economy, information technology constitutes an integral part of organizational work (see Agarwal and Karahanna, 2000). The use of advanced information technologies (such as internet, social network software, video/tele-conference, e-mail, repositories, data warehouse, and database software) are useful in the KM process for reducing time and costs as well as ensuring better service offerings to customers (see Pan and

Scarbrough, 1999). Alavi and Leidner (2001) proposed three different views of knowledge, that is, as object, process and capabilities. Knowledge as an object is related to information access and its implication is that, KMdevelops on building and managing information stock. Viewing knowledge as a process means that KM should be concerned with how knowledge and information is to be created, shared, and distributed among all employees within a firm. Finally, if knowledge is seen as capabilities, then KM is to lead employees of a firm to build their competencies, skills and produce intellectual capital. This study integrates the three views in formulating its framework.

In the domain of KM, frameworks are widely used to describe concepts, components, design aspects and their interdependencies for a common understanding of the concept in question (see, for e.g, CEN, 2004; Maier, 2007). One of the most prominent frameworks currently used in practice is the framework proposed by CEN (2004). The framework provides a common terminology and frame of reference for firms that need to develop KM system or are involved in KM (see Pawlowski and Bick, 2012). The framework is shown in Figure 1 below:

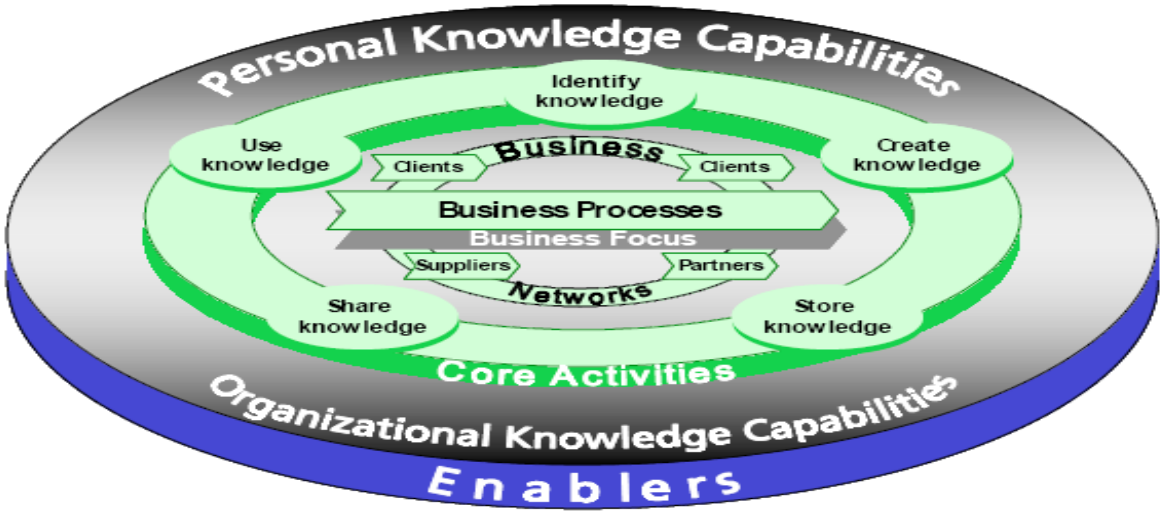

Figure 1: Knowledge Management Framework, see CEN, 2004

The framework proposed by CEN (2004) depicts a clear process orientation with the ultimate aim of describing core business processes as well as knowledge-based processes. The framework extends these aforementioned processes by enablers: knowledge capabilities of on an individual

level, such as skills, competencies or expertise as well as organizational level, such as vision, strategy.

As knowledge is considered a critical element for firm's internationalization, KM activities such as knowledge identification, knowledge creation or acquisition, knowledge storage, knowledge sharing as well as its effective and efficient application is inevitable. Meanwhile, the success of KM initiatives depends primarily on knowledge sharing (Wang and Noe, 2010). Due to the potential benefits that can be realized from knowledge sharing, this study focuses on knowledge sharing as one fundamental knowledge-centered activity. A conceptual model of knowledge sharing within a broad KM framework is therefore proposed as an indispensable tool for SMEs internationalization. This is important because there is still not enough studies that focus on managing knowledge resources in the internationalization process of SMEs. Hence, it is imperative to explore how knowledge sharing can be encouraged and enhanced within a KM initiative for SMEs internationalization. It also seeks to bridge the current gap in the internationalization literature regarding knowledge sharing within a broad KM framework and sustainable competitive advantage.

2.8 Knowledge sharing as a critical success factor

Broadly speaking, knowledge sharing is concerned with communicating knowledge among individuals or with a group of people. The main goal is to utilize available knowledge in improving the individual or group's performance (see, for e.g., Alavi and Leidner; 1999; Salisbury, 2003). Knowledge sharing is increasingly becoming an important topic for researchers and practitioners to ensure that practice and policy are based on sound evidence (see Tsui et al., 2006). Thus, it is considered as a tool that seeks to promote evidence-based practice and decision making, as well as to promote exchange and dialogue among individuals or groups of researchers, policymakers, managers and employees.

Firms need knowledge sharing because the sharing process involves more than just collecting data and information (see Berends et al., 2003). For this reason, motivating people to contribute knowledge has become a critical issue in research and a major challenge for firms (see Liang et al., 2008). Moreover, the sharing of knowledge constitutes a major challenge in the field of KM due to some employees' resistance to share their knowledge with the rest of the firm. Knowledge

sharing has the potential to greatly improve competency, work-quality, problem-solving efficiency, decision-making skills as well as overall performance (see, for e.g., Syed-Ikhsan and Rowland, 2004; Yang, 2007). Therefore, managers need to understand the mechanism that drives individuals to contribute their invaluable knowledge in order to promote knowledge sharing at the workplace.

Knowledge sharing is often separated into two: open-network sharing and closed-network sharing. Open-network sharing is related to the sharing of knowledge among individuals of a group through a KM system. Thus, in an open-network, sharing is done through a central database system commonly referred to as a KM system. This implies that multiple individuals share multiple knowledge resources in the KM system. On the other hand, closed-network sharing is an informal way of sharing knowledge where individuals have the liberty to choose who partners to share their knowledge as well as to decide the mode of sharing. In a closed-network, knowledge sharing is person-to-person. The open-network sharing is the most widely used mechanism in organizations for sharing organization-base knowledge.

Although many factors influencing the level or amount of knowledge sharing have been found, there is still inadequate empirical evidence available (see Wang and Noe, 2010) and the means by which useful knowledge sharing is initiated and realized is left unexplored (see Berends et al., 2003). The main objective of this study is to develop a model that classifies the key factors into three dimensions, namely organizational, individual-level and technological factors) to investigate whether these factors being adopted from existing literature can really explain an individual's knowledge sharing behavior. The ultimate reason for choosing these two broad factors is because of their salient roles in previous studies.

2.9 Areas of focus in knowledge sharing

In recent years, researchers have explored many antecedents of knowledge sharing in various contexts (see Wange and Noe, 2010) and the nature of sharing relationships has also been documented by other studies (see, for e.g., Hislop, 2003; Kim and Lee, 2006; Lin 2007). In spite of the enormous studies on the concept of knowledge sharing, little is known of any systematic investigation of the effect of organizational, individual-level and technological factors on

knowledge sharing. Therefore, reference would be made mostly to existing literature on these broad factors and general theories applicable to them in the course of the study.

In order to fully understand why and how individuals choose to share knowledge, their motivation (i.e., what drives them) must be understood. This study identifies three main factors that influence knowledge sharing in a firm. These are: organizational factors (including management support, rewards/incentives, leadership, organizational culture), individual-level factors (which include interpersonal trust, individual attitude, perceived benefits/costs and individual self-efficacy) and technological factor (i.e., information technology (IT) support). Each area of focus is explained below and consists of relevant issues and theories relating to these factors.

2.9.1 Organizational factors

2.9.1(a) Management support

Management support has been found to be a key factor influencing employees' perceptions of knowledge sharing behavior and willingness to share knowledge (see Wang and Noe, 2010). Some researchers have found that senior management support is important to promote knowledge sharing (see, for e.g., Macneil, 2001; Hislop, 2003). Managers and colleagues support and their encouragement of knowledge sharing was found to influence employees' perceptions of the usefulness of knowledge sharing as well as their knowledge exchange (see, for e.g., Connelly and Kelloway, 2003; Lin, 2007). Lee et al. (2006) also found that top management support influenced both the quality and level of knowledge sharing by way of influencing employee commitment to KM. Nonetheless, King and Marks (2008) did not find a significant effect of perceived management support when they controlled for ease of use and usefulness of KM system. In light of this, Wang and Noe (2010) argued that management support specific to knowledge sharing is a better predictor of employees' knowledge sharing behavior. Each of these studies show a very large extent that top management support likely affects knowledge sharing.

2.9.1(b) Incentives/rewards

Incentives have been suggested to be a key motivating factor for knowledge sharing across cultures (see Yao et al., 2007). A study conducted by Kim and Lee (2006) found that firms that

emphasize on performance-based system contributes to knowledge sharing. Both social exchange and social capital theories have been found to support the notion that organizational rewards, such as increased salary, bonus and promotions are positively associated with employees' knowledge sharing (see Kankanhalli et al., 2005). According to Nelson et al. (2006), incentives, including recognition and rewards play a major role in facilitating knowledge sharing and in building a supportive culture. In contrast to the expected positive effect of incentives/rewards on knowledge sharing, the results of empirical studies investigating how extrinsic rewards affects knowledge sharing have been mixed (see Wang and Noe, 2010). Overall, these studies show that incentives/rewards likely influence knowledge sharing.

2.9.1(c) Leadership

Leadership is very central to the discussions of knowledge processes and management in academic literature. According to Leithwood et al. (1999), one of the most cited aspects of leadership that contributes to knowledge sharing is leadership style. The term leadership is related to the process of including and influencing others towards achieving some desired goals (Jong and Hartog, 2007). A leadership style is concerned with the behavior a leader exhibits while guiding, or providing directions to his/her followers. Leadership styles include authoritarian, democratic, transactional, transformational and the likes. An effective leader acts as role models and in a manner that facilitates knowledge sharing as well as ensures there are incentives for doing so (Kerr and Clegg, 2007). Chen et al. (2004) found transformational leadership behaviors (i.e., leadership style) to be a significant predictor of internal knowledge sharing. A study conducted by Bradshaw et al. (2015) shows that an effective leadership style strongly influences knowledge sharing. These studies have shown that leadership is a likely predictor of knowledge sharing behavior.

2.9.1(d) Organizational culture

Organizational culture refers to the shared values, beliefs and principles that an organization adopt for its members. Organizational culture is an important factor when it comes to knowledge sharing within and across organizations (see, Lai and Lee, 2007). Thus, an organizational culture that facilitates knowledge sharing can lead to an effective KM system. Al-Alawi et al. (2007) found that organizational culture is positively related to knowledge sharing. To Connelly and

Kelloway (2002), employees are willing to share knowledge in an enabling environment. Culture elements within an organizational setting is essential for successful knowledge sharing (Kerr and Clegg, 2007). It is clear from these studies that, organizational culture enhances knowledge sharing.

2.9.2 Individual-level factors

2.9.2(a) Interpersonal trust

Many studies have used social exchange theory to examine how trust between individuals or among individual in a group affect knowledge sharing (see, for e.g., Levin, 1999; Andrews and Delahay, 2000; Bakker et al., 2006). Trust is a multidimensional construct which expresses the belief or expectation about the other party that results from that party's expertise, intention, honesty, benevolence or reliability (see Cheng et al., 2008). In organizations where trust exists, employees are more willing to share their knowledge among themselves (Levin, 1999; Andrews and Delahay, 2000). Previous studies found that trust between colleagues is an important factor which is believed to have a strong influence on knowledge sharing (Andrews and Delahay, 2000; Al-Alawi et al., 2007, Wang and Noe, 2010). Bakker et al. (2006) have also argued that, trust among people is critical for a successful knowledge sharing. Moreover, a study conducted by Issa and Haddad (2008) shows that mutual trust among employees is necessary for knowledge sharing to take place within and across firms. These studies show that interpersonal trust likely influence knowledge sharing.

2.9.2(b) Individual attitudes

Individual behaviors are usually influenced by beliefs and attitudes (Davis 1989). Some studies have shown that individual attitudes affect knowledge sharing. For example, Bock and Kim (2002) have shown that individuals' expectations of the usefulness of their knowledge and that when shared with others, they could improve their relationships have been found to be related to positive knowledge sharing attitudes. They further indicated that this was related to knowledge sharing intentions and behaviors. Similarly, attitudes towards knowledge sharing have been shown to have both direct and indirect effects on knowledge sharing (see, for e.g., Bock et al., 2005; Lin 2007). Meanwhile, the indirect effect was found to be related to self-reported sharing

behavior through positively influencing intentions to share. Overall, these studies show that individual attitudes are important considerations influencing the passion to share knowledge.

2.9.2(c) Perceived benefits/costs

Perceived benefits/costs have been found as one of the most studied antecedents of knowledge sharing (Wang and Noe, 2010). Social exchange theory, however, support the notion that individuals assess the perceived ratio of benefits to costs and make their decisions based on the expectation that it will lead to rewards such as recognition, respect and extrinsic incentives (see, Emerson, 1981). In line with this theory, studies show that perceived benefits are positively related to knowledge sharing. Meanwhile, perceived costs have a negative effect on knowledge sharing (Wang and Noe, 2010). It is important to note that most of the studies of perceived benefits/costs were conducted in the context of professional communities. Previous studies suggest that knowledge sharing is closely related to individuals' belief that their shared knowledge is useful to others as opposed to the personal benefits they gain, particularly in a professional network (see, for e.g., Chiu et al., 2006; Siemsen et al., 2007). It is clear from these studies that perceived benefits/costs have influence on knowledge sharing.

2.9.2(d) Individual self-efficacy

Self-efficacy which refers to an individual's belief in his/her ability to perform a specific task is a key cognitive mediator of the motivation process (see, Bandura, 1997) and a predictor of knowledge sharing (Lee et al., 2007). Thus, the process of self-efficacy formation is believed to provide useful information about how individuals choose to share complex knowledge. For example, when individuals develop self-efficacy perceptions about their performance in a specific area, these perceptions are reflected in their belief systems (Lee et al., 2007). However, self-efficacy in the ability to share knowledge should influence knowledge sharing. Higher self-efficacy in an individual's ability to share knowledge may result in challenging personal goals, more effort and persistence as well as higher satisfaction and performance (see Banduras, 1997). Self-efficacy theory suggests that individuals with strong efficacy beliefs are more confident in their capacity to execute a behavior. To Banduras (1997), perceived self-efficacy influence how successfully goals are achieved by affecting the level of effort and persistence an individual

exhibit in the face of constraints. The implication of self-efficacy theory to knowledge sharing shows that individual self-efficacy likely influence knowledge sharing.

2.9.3 Technological factor

Technology is highly recognized as an enabler and facilitator among individuals and groups for the purpose of knowledge sharing (Hansen et al., 1999). The ultimate role of technology is to create a connected virtual environment for knowledge sharing by allowing knowledge seekers to identify and communicate with knowledge sources (see Handzic and Hasan, 2003). This implies that, a free exchange of information enables individuals to propose new ideas, exchange concepts, access data, overcome challenges and find solutions that are useful and beneficial to their firm. According to Andersen (1998), most firms implement a variety of technology to connect people and enable their interaction and collaboration. However, the ease use of this collaboration technology increases knowledge sharing between people and the firms where they work. That is, it fosters an individual's willingness to share knowledge. Some researchers argue that technology lacks the emotional richness and depth of real personal interaction (see Santosus, 2001), and thus, is incapable of developing better relationships and an understanding of the complexities of situations (see Bender and Fish, 2000). Other researchers embrace technology and argue that the role of technology in knowledge sharing is no less effective than face-to-face interaction (see, for e.g., Warkentin et al., 1997). More cyber-communities have started to challenge traditional ideas about the need for physical presence by various communities (Hanzic et al., 2004). From these studies, it is clear that technology has a likely influence on knowledge sharing.

2.10 A conceptual model of knowledge sharing

From a practical point of view, understanding the relationship between the organizational, individual-level and technological factors and knowledge sharing is critical for firms, especially SMEs. From a theoretical point of view, it is reasonable to assume that all the factors (i.e., organizational, individual-level and technological factors) significantly influence knowledge sharing as shown in the model below. However, if this is the case, then organizational, individual-level and technological factors are predictors of knowledge sharing as depicted in the Knowledge sharing chain showing the relationship between the independent variables (i.e.,

organizational, individual-level and technological factors) and the dependent variable (i.e., knowledge sharing). The model (illustrated in figure 2) also suggests the dependency of individual-level factors on organizational and technological factors. This study, therefore, seeks to empirically examine these relationships.

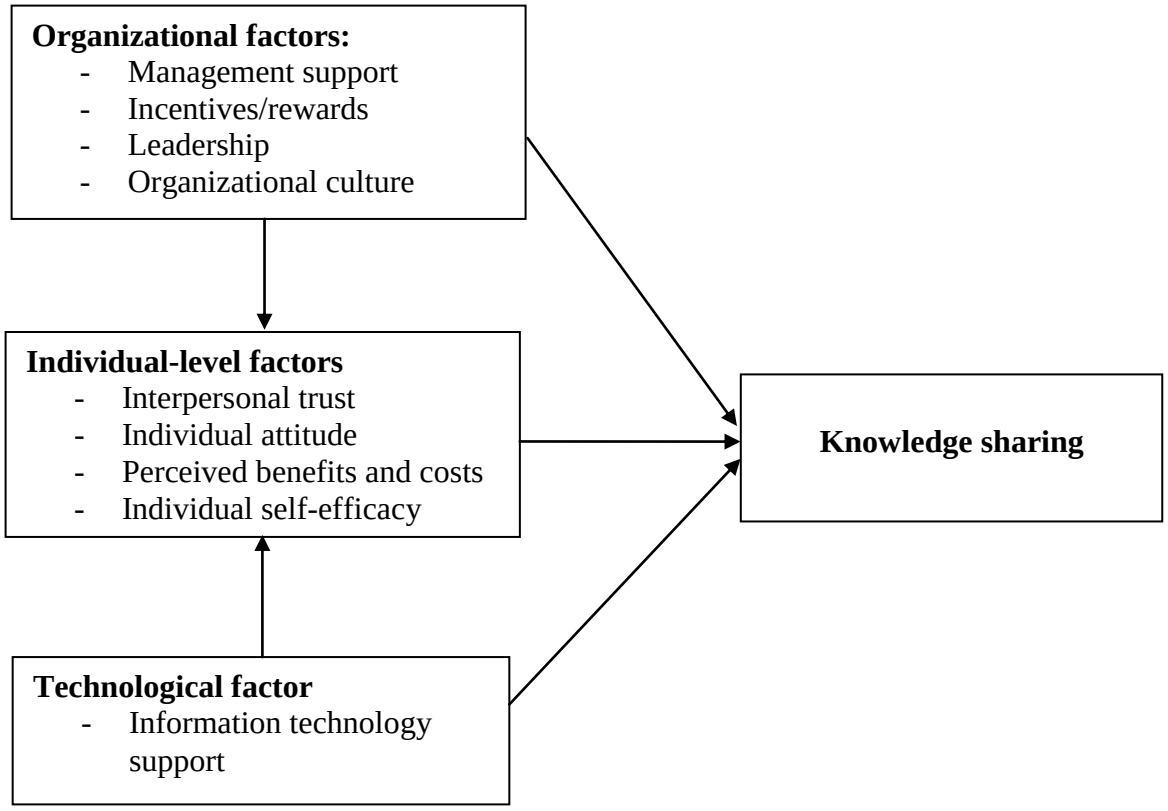

Figure 2: A conceptual model of knowledge sharing

In view of the reviewed existing literature and on the basis of the relationship of the variables shown in the proposed conceptual model of knowledge sharing (see figure 2), the following research hypotheses have been formulated to guide the study:

H1: There is a positive correlation between organizational factors and knowledge sharing

H2: Technology is positively associated with an individual's knowledge sharing behavior

H3: There is a positive relationship between Individual-level factors and knowledge sharing

H4: Individual-level factors will mediate the relationship between organizational factors and knowledge sharing

H5: Individual-level factors will mediate the relationship between technological factor and knowledge sharing

H6: Organizational and technological factors predict individual-level factors to share knowledge

Chapter three

Data and methods

3.1 Overview

This chapter presents the research methodology used in this study. It includes the research design, population and sample, data collection and analysis and operationalization of the variables.

3.2 Research design

This study is a quantitative research to identify any causal relationships between the variables that pertain to the research problem. The hypotheses deduced are tested from the data collected through questionnaire survey. A structured survey questionnaire is administered to twenty-five (25) SMEs chosen randomly, mainly five (5) employees and five (5) senior managers who are the key participants and decision-makers with regards to sharing knowledge in these firms. Each variable of interest utilized in this study is measured by either four (4) or six (6) items using five-point Likert scale ranging from the following: (1) strongly disagree to (5) strongly agree; (1) very little extent to (5) very very great extent; and (1) never to (5) very often.. Multiple regression and correlation analyses are used to test the research hypotheses outlined in this study and the unit of analysis is the individual. The details as to what sample is being used, how the variables are measured as well as how data is collected and analysed in order to answer the research questions are, however explained in sections 3.3, 3.4 and 3.5.

3.3 Population and sample

The population of this study is chosen randomly and comprises of all SMEs within Norway. A sample size of five hundred (250) respondents have been chosen for the purpose of this study. Two different groups, including employees and senior managers within such firms are used in the survey. However, the survey comprises of at most five (5) of each group of the SMEs selected. This is because, a sample size larger than 30 and less than 500 is appropriate for most research (see Roscoe 1975). This implies that a total of twenty-five (25) SMEs would be selected.

3.4 Data collection and analysis

The data for the quantitative study is collected through survey questionnaires using SurveyMonkey and personal delivery to respondents who are unable to provide email addresses. The measurement scale being used is 5 point Likert scale with response categories ranging from 'strongly disagree' to 'strongly agree', which require respondents to indicate a degree of disagreement or agreement with each of the series of statements related to the selected variables of interest. The questions in the questionnaire are categorized into several sections. The first section of the questions is related to general characteristics of the respondents. The other sections comprise of statements measuring the effect of each variable of interest on knowledge sharing. Notice that the items/statements measuring the variables of interest were mixed before sending the questionnaire out to prevent a "halo effect" from occuring. The ultimate aim of the corresponded statements was to measure the influence/impact of the organizational, individual-level and technological factors on an individual's knowledge sharing behavior.

In order to analyse that data gathered on the incorporated questionnaires through SurveyMonkey and/or personal delivery, a quantitative tool commonly referred to as Statistical Package for Social Sciences (SPSS) software is used. The following techniques of statistical analysis are used in the analysis: Regression Analysis; Factor Analysis; Correlation Analysis; and Mediation analysis. The Cronbach's Alpha coefficient is also used in this study to measure the internal consistency and reliability of the test scores obtained.

3.5 Operationalization of the variables to a questionnaire

Appendix B sets out the specification and measurement of the variables included in the conceptual model of knowledge sharing in this study. A detailed description of each component of the three broad independent variables (i.e., organizational, individual-level and technological factors) and the dependent variable are indicated in table 1. Some items measuring these sub-variables were adapted from previous literature on knowledge sharing. Other items were drawn from existing literature and altered to fit the knowledge sharing context. Each independent variable utilized in this study are measured by four (4) items using five-point Likert scale ranging from strongly disagree to strongly agree. This implies that respondents are asked to evaluate each statement listed in the questionnaire under that category on a scale from (1)

"strongly disagree" to (5) "strongly agree". Statements related to management support, incentives/rewards, leadership, organizational culture, interpersonal trust, individual attitude, perceived benefits/costs, individual self-efficacy, information technology support are provided to examine the key factors influencing knowledge sharing among SMEs.

On the other hand, this study measures knowledge sharing by six (6) items using five-point Likert scale based on: (i) the extent to which an individual uses different forms of channels (e.g., informal interaction, organizational database); (ii) the extent to which an individual share different types of knowledge (e.g., personal experience, expertise, ideas); and (iii) the frequency of knowledge sharing. This means that respondents are asked to rate each question measuring knowledge sharing in the questionnaire on a scale from either (1) "very little extent" to (5) "very great extent" or from (1) "never" to (5) "very often". However, the questions relate to these three (3) criteria. In addition to this, respondents are asked to evaluate two (2) statements relating to their knowledge sharing using five-point Likert scale ranging from (1) "strongly disagree" to (5) "strongly agree". It is worth noting that, this study measures knowledge sharing (i.e., the dependent variable) separately from the independent variables.

Table 1 shows the estimation of component categories for measuring the variables of interest as the sum of the items indicated under each variable.

Table 1: Estimation of the components category for measuring the variables of interest

Organizational factors	Individual-level factors	Technological factor	Knowledge sharing
Items 1 to 16	Items 17 to 32	Items 33 to 36	Items 37 to 42

Chapter four

Analysis and Discussion

4.1 Overview

This chapter presents and discusses findings from the data collected and analysed in more depth. To facilitate understanding, this chapter is divided into six (6) sections. The first section discusses the descriptive statistics of all samples and highlight on the response rate. The second section also discusses the measure of reliability or reliability statistics. The third section discusses the factor analysis of the survey items used in measuring the variables of interest. The fourth section compares the correlation between the variables of interest. The fifth section presents and discusses mediation analyses between the variables of interest. The last section discusses the regression analysis that was used to establish the relationship between the variables of interest.

4.2 Descriptive statistics of all samples

Out of the two hundred and fifty (250) questionnaires distributed, two hundred and thirty-seven (237) were answered. This represents a response rate of 94.80%. The sample for the study consists of 237 respondents who ranged from 20 to above 35 years of age (see Table 4). Table 4 further indicates that the majority of the respondents are younger (i.e., 20 to 30 years of age), representing about 65.81%. The findings show that male respondents were more than females. Thus, the gender was distributed unequally: 145 males representing 61.2% and 92 females representing 38.8% (see Table 3). The mean age group and gender are 3.29 (SD = 1.019) of age groups and 1.61 (SD = 0.488) of both genders respectively, for all the samples (see Table 2).

From the descriptive statistics, the total average knowledge sharing score for all the samples is 22.33 (SD = 3.208). Meanwhile, the overall average score of the organizational, individual-level and technological factors are 54.98 (SD = 6.103), 59.03 (SD = 6.045) and 13.78 (SD = 2.164) respectively, for all the samples (see Table 2). It can be observed from the descriptive statistics report that, the average score varies across the components of each broad category. The average scores are as follows: *1) management support* is 13.68 (SD = 2.304); *leadership* is 14.13 (SD = 2.291); *incentives/rewards* is 12.52 (SD = 2.166); and *organizational culture* is 14.65 (SD =

2.215) for organizational factors; *2) interpersonal trust* is 14.38 (SD = 2.559); *individual attitude* is 15.27 (SD = 2.104); *perceived benefits/costs* is 15.60 (SD = 2.181); and *individual self-efficacy* is 13.78 (SD = 2.581) for individual-level factors; and *3) IT support* is 13.78 (SD = 2.164) for technological factor (see Table 2).

Table 2. Descriptive Statistics for all samples

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Gender	237	1	1	2	1.61	.488	.239
Age group	237	3	2	5	3.29	1.019	1.038
Management support	237	9.00	9.00	18.00	13.6835	2.30444	5.310
Leadership	237	10.00	9.00	19.00	14.1308	2.29124	5.250
Incentives/rewards	237	9.00	8.00	17.00	12.5232	2.16592	4.691
Organizational culture	237	10.00	10.00	20.00	14.6498	2.21506	4.906
Interpersonal trust	237	11.00	9.00	20.00	14.3797	2.55932	6.550
Individual attitude	237	9.00	11.00	20.00	15.2658	2.10352	4.425
Perceived benefits/costs	237	10.00	10.00	20.00	15.6034	2.18112	4.757
Individual self-efficacy	237	12.00	8.00	20.00	13.7806	2.58138	6.664
IT support	237	9.00	9.00	18.00	13.7764	2.16398	4.683
Organizational factors	237	25.00	43.00	68.00	54.9873	6.10326	37.250
Individual-level factors	237	27.00	43.00	70.00	59.0295	6.04531	36.546
Technological factor	237	9.00	9.00	18.00	13.7764	2.16398	4.683
Knowledge sharing	237	13.00	16.00	29.00	22.3333	3.20795	10.291
Valid N (listwise)	237						

Table 3. Gender of respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	92	38.8	38.8	38.8
	Male	145	61.2	61.2	100.0
	Total	237	100.0	100.0	

Table 4. Age group of respondents

Age group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20--25 years	55	23.2	23.2	23.2
	26-30 years	101	42.6	42.6	65.8
	31-35 years	38	16.0	16.0	81.9
	Above 35 years	43	18.1	18.1	100.0
	Total	237	100.0	100.0	

4.3 Reliability statistics

In order to check the consistency of the statements or questions to reflect the construct/variable that it measures, the Cronbach's Alpha was computed. The Cronbach's Alpha which measures the statistical reliability is needed in order to ensure the validity and precision of the statistical analysis. The results obtained with respect to the measurement of how the predictor variables influence the degree and extent to which, as well as the frequency with which one engages in knowledge sharing is adequately reliable. Thus, the Cronbach's Alpha obtained for the items measuring the variables of interest equals 0.859 (see Table 5.1). This implies that, the results are representative. The results also indicate that the items measuring the predictor variables are adequately reliable. Thus, the Cronbach's Alpha obtained for the items measuring organizational, individual-level and technological factors equals 0.653, 0.703, 0.527 respectively (see Tables 5.2, 5.3, 5.4). Similarly, the Cronbach's Alpha obtained for the items measuring knowledge sharing behavior equals 0.686 (see Table 5.5). This also implies that the dependent variable, in which case, knowledge sharing bahavior is adequately reliable.

Table 5.1 Reliability Statistics (for all items measuring the variables of interest)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.859	.876	42

Table 5.2 Reliability Statistics (for items measuring the organizational factors)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.653	.672	16

Table 5.3 Reliability Statistics (for items measuring the individual-level factors)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.703	.745	16

Table 5.4 Reliability Statistics (for items measuring the technological factor)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.527	.532	4

Table 5.5 Reliability Statistics (for items measuring knowledge sharing behavior)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.686	.710	6

4.4 Factor Analysis

From the Factor Analysis, it can be observed that the items included in this analysis can be separated into a clear dimension and can however be inferred that, the items are related (see Table 6.2). It must be acknowledge that there were 42 items and 237 respondents, making it adequate to make a comprehensive conclusion on the Factor Analysis. Here, emphasis was placed on the Extracted Sums of Squared Loadings % of variance (see Table 6.1). Notice that the first component/item accounts for 20.28% of the variance, the second 8.51%, the third 7.05%, the fourth 6.62%, fifth 6.11%, the sixth 5.12% and from the seventh to the fourteenth were below 5%. All the remaining factors were not significant (see Table 6.1). This implies that there were 14 items which contributed towards why respondents may or may not share their knowledge. Table 6.2 shows the loadings (i.e., extracted values of each item under 14 items) of the 42 items on the 14 factors extracted. Table 6.2 also indicates that, a number of statements had slighly higher absolute values of the loading and thus, contributes more to the 14 items extracted. Notice that the individual items were loaded together to investigate the presence of latent variable(s). It was done to consider all of the available variance in order to determine the number of significant factors based on the most explained variance and indicate how the dimensions of the factors are better accounted for by the items.

Table 6.1 Factor Analysis – Total Variance Explained

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.516	20.277	20.277	8.516	20.277	20.277
2	3.575	8.513	28.789	3.575	8.513	28.789
3	2.962	7.054	35.843	2.962	7.054	35.843
4	2.781	6.620	42.463	2.781	6.620	42.463
5	2.568	6.114	48.577	2.568	6.114	48.577
6	2.149	5.117	53.694	2.149	5.117	53.694
7	1.924	4.581	58.275	1.924	4.581	58.275
8	1.807	4.302	62.577	1.807	4.302	62.577
9	1.714	4.081	66.658	1.714	4.081	66.658
10	1.412	3.362	70.020	1.412	3.362	70.020

11	1.340	3.190	73.211	1.340	3.190	73.211
12	1.241	2.955	76.166	1.241	2.955	76.166
13	1.122	2.672	78.838	1.122	2.672	78.838
14	1.047	2.493	81.331	1.047	2.493	81.331
15	.935	2.227	83.558			
16	.835	1.988	85.546			
17	.745	1.775	87.321			
18	.661	1.573	88.893			
19	.619	1.475	90.368			
20	.578	1.376	91.745			
21	.542	1.292	93.036			
22	.455	1.083	94.119			
23	.397	.945	95.063			
24	.342	.814	95.877			
25	.289	.689	96.566			
26	.263	.625	97.192			
27	.205	.488	97.680			
28	.196	.466	98.146			
29	.151	.360	98.505			
30	.120	.287	98.792			
31	.106	.253	99.045			
32	.082	.195	99.240			
33	.077	.184	99.424			
34	.068	.163	99.587			
35	.062	.149	99.736			
36	.044	.104	99.840			
37	.028	.066	99.906			
38	.019	.044	99.950			
39	.012	.029	99.979			
40	.006	.014	99.993			
41	.002	.005	99.998			
42	.001	.002	100.000			

Extraction Method: Principal Component Analysis.

Table 6.2 Factor Analysis – Component Matrix

Component Matrix[a]

	Component													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Sharing knowledge with co-workers would earn me recognition and respect	.531	.295	.177	.204	-.039	.196	.222	.325	.208	-.198	-.005	-.092	-.251	-.258
Sharing of knowledge with co-workers has not always been an enjoyable experience	.166	.073	-.278	.022	.232	.233	.313	.333	.011	-.107	-.355	.118	.035	.231
The information technology support of my firm makes knowledge easily accessible	.489	-.124	-.206	-.302	.371	.085	.114	.095	.327	-.010	-.279	-.083	-.276	.056
I do not share my knowledge at the request of my co-workers	.641	.001	-.142	-.033	-.112	-.122	-.089	-.428	-.042	.009	-.328	-.065	-.244	-.005
I can perform my duties at work with little or no coordination with others	-.132	.163	.279	-.183	-.161	.685	.294	-.147	.146	.145	-.063	.104	.193	-.036
I find that my values and the firm's values are similar	.479	.341	.178	.114	.012	.295	-.402	.081	-.115	.142	.053	.072	-.275	-.250
I feel good about sharing my expertise and experience with co-workers	.552	.046	.246	-.136	.217	.255	-.170	.083	.045	-.241	-.152	-.101	.112	-.057
The skills, behaviors and attitudes of our leaders are not appropriate for the firm	.394	-.184	-.381	-.138	.062	.055	-.306	.007	-.131	-.200	.277	.383	-.185	-.020
I can count on my co-workers to do what is right, even if not monitored	.417	.048	.194	.532	.222	.163	.313	-.121	.068	.017	.180	-.251	.075	.044
I frequently perform my tasks without consulting others	.078	.167	.748	.013	.039	-.059	.141	.098	.263	-.130	.263	.012	-.045	.327
I always want to share my expertise, experience and ideas with co-workers	.627	.316	-.016	-.134	.131	.196	-.132	-.041	-.070	.140	.055	-.220	-.282	.142

I do not receive a clap offering, a souvenir or a special package for sharing new ideas, expertise or knowledge during meetings	-.075	.288	-.282	-.377	.228	-.042	.363	.273	-.211	.201	.253	.091	.226	-.168
I consider my co-workers as people who can be trusted	.339	.410	.146	.568	.100	-.374	.100	.057	-.047	-.080	-.049	.180	.119	.000
The leadership of the firm has the ability to inspire and gain the most from us (i.e., employees)	.433	.514	-.008	.075	.275	.016	-.141	-.013	-.040	.202	.047	.440	-.011	.076
I do not share my expertise or knowledge wholeheartedly	.562	-.367	-.109	-.065	.215	.084	-.290	.200	-.142	.015	.177	-.226	.195	.247
I can not count on my co-workers to get the job done right	.241	-.603	.136	.292	.389	-.102	.240	.084	-.211	.213	.212	-.054	-.020	.049
We do not have regular meetings to address challenges and/or share ideas and knowledge about work, projects, etc.	.304	-.079	-.080	-.139	.412	.175	.109	-.223	.507	.006	-.018	.198	.105	.169
I often use informal interaction to share knowledge	.552	.264	-.097	-.124	.100	.067	.070	-.441	-.161	-.148	-.038	-.127	.358	.228
I do not have to ask for help in order to do my job	-.003	-.046	-.646	-.056	-.104	.038	.018	.286	-.284	-.182	-.244	.349	-.027	.245
The management of the firm is flexible that they support the individual (i.e., employee)	.442	.312	-.423	.283	.095	.194	-.219	.182	-.064	.190	.023	-.048	-.004	-.006
My firm does not reward better performance of individuals	.149	.608	-.344	-.453	.256	-.136	-.061	.012	.072	-.052	.061	-.026	.130	.180
I often use the firm's database to share knowledge	.213	.251	-.454	.326	-.438	.217	.217	.262	.141	.132	.035	.122	.071	-.132
I do not consider my co-workers as people who are trustworthy	.510	-.004	.034	.264	.431	-.136	.218	-.062	-.275	-.319	-.027	.172	-.055	-.083
The information technology support of my firm has not always made knowledge sharing an enjoyable experience	.587	.061	-.034	-.220	.103	-.145	.048	.279	-.290	.339	-.227	-.137	.202	-.171

I have a work manual which is updated from time to time	.136	.126	.095	.327	-.161	-.298	.088	-.238	.047	.591	.004	-.123	-.224	.251
Sharing knowledge with co-workers would strengthen our relationship	.508	.197	.088	.503	-.105	.127	-.114	-.202	.109	-.258	-.008	-.045	.205	-.192
I work fairly independently of others at my job	.136	.105	.234	-.046	-.250	.638	.087	-.358	-.289	.051	.150	.110	-.024	.045
The management of the firm organizes workshops or seminars for employees on a regular basis	.156	.089	.119	-.019	-.073	-.246	-.297	-.061	.609	.306	.087	.262	.315	-.152
My firm pays for the cost of employee's professional development or training	.459	-.325	-.160	.458	.119	.186	-.372	.007	.078	.252	-.124	.043	.113	.139
I like sharing my knowledge with co-workers	.606	.036	.139	-.269	-.504	.033	.102	.170	-.281	.030	-.030	.108	.103	.163
I find that co-workers do not like to share their personal experience, expertise and ideas	.551	-.470	.153	-.021	-.009	.112	.038	.261	.038	.072	.310	-.148	.091	-.167
I am given time and/or access to our firm's web portal for knowledge sharing	.542	-.528	-.167	-.131	-.347	-.066	-.066	-.069	.106	-.030	-.163	.101	.028	.034
I often share different types of knowledge, such as personal experience, expertise or ideas with co-workers	.651	-.084	.044	-.165	-.530	-.270	.066	.114	.135	-.175	.119	.131	-.014	.050
Sharing knowledge with co-workers would enhance my personal reputation	.592	.272	.208	-.074	-.358	-.132	-.166	.192	-.004	-.161	-.132	-.127	-.024	.124
My firm recognizes employees for their role in knowledge sharing	.450	.598	-.147	-.045	-.165	-.387	.202	.004	.043	-.062	.250	-.133	-.093	.085
The information technology support of my firm makes me share knowledge with ease	.465	-.166	-.326	-.288	-.188	.156	.395	-.193	.154	.168	.290	-.023	-.220	.001
I am informed of any changes in my work or projects that I am involved in before implementation	.496	.047	.300	-.239	-.032	-.156	.140	-.096	.061	.179	-.315	-.276	.171	-.273
I am mandated to put in writing (i.e., document) my tasks and the steps/procedure I go through in getting the task done	.155	-.286	-.425	.451	-.206	-.059	.463	-.033	-.025	-.036	-.235	.179	.019	.074

I do not have the intention of sharing my expertise, knowledge or experience with co-workers	.704	-.244	.038	-.225	-.042	-.100	.075	-.296	-.150	.011	-.031	.156	-.002	-.191
My firm has a clearly articulated mission and vision statement which is translated into behavioral standards and communicated across the firm so that employees know what is expected of them	.556	-.394	.166	-.083	.053	.018	.032	.341	.325	-.022	.011	.043	-.070	.061
Sharing knowledge with co-workers would not improve my personal development	.705	-.296	.009	.033	-.090	-.139	-.069	-.163	-.139	-.098	.226	.042	.168	.005
The information technology support of my firm is not adequate	.264	-.040	.392	-.231	.454	-.238	.188	-.211	-.038	.087	-.023	.246	-.148	-.241

Extraction Method: Principal Component Analysis.

a. 14 components extracted.

4.5 Correlation

In accordance with the central limit theorem, and keeping in that the sample size of this study equals 237 answered questionnaires, the researcher assumed that, the sample distribution of knowledge sharing and its predictors are approximately normal regardless of the shape of the sample data. The assumption made allows the researcher to use Pearson's correlation to measure the strength of the relationship between the predictor variables, in which case, organizational, individual-level and technological factors and knowledge sharing. Table 7 clearly shows that, the correlation coefficients for each path, that is, the links between each of the variables of interest, is statistically significant.

From the Pearson's correlation, it can be observed that, there is a significant relationship between the organizational factors and knowledge sharing, $r = 0.701$, $p = 0.000$ (see Table 7). Thus, the results show that a positive relationship exists between the organizational factors and knowledge sharing. However, in order to make a direct conclusion about the causality from the correlation, the researcher computed R^2. In this case, $R^2 = 0.492$ and shows that the organizational factors shares 49.2% of the variability in knowledge sharing. This implies that, the more positive or effective the organizational factors are, the higher the degree and extent of knowledge sharing there will be among SMEs. Analysing the correlation between organizational factors and knowledge sharing, the researcher observed that the organizational factors had a relatively strong positive correlation with respondents' knowledge sharing behavior ($r = 0.701$, $p = 0.000$). On the basis of this, the researcher confirms the hypothesis of the study: *H1: There is a positive correlation between organizational factors and knowledge sharing*.

Hypothesis 1 (i.e., *H1*) is supported as the elements of the organizational factors under review have been in many previous studies applying them in models to explain knowledge sharing behaviors. Thus, it is consistent with the findings of previous studies that each of these elements (i.e., management support, incentives/rewards, leadership, organizational culture) play a major in facilitating knowledge sharing as well as in building a supportive culture within a firm (see, for e.g., Macneil, 2001; Hislop, 2003; Sabatier and Nelson, 2006; Al-Alawi et al., 2007; Kerr and Clegg, 2007). This implies that the ability of SMEs to capitalize on these key organizational factors becomes the critical step in overcoming the major challenge of encouraging people to

contribute knowledge cited by Liang et al. (2008). Notice that, it is only when managers understand the mechanism that drives organizational members to contribute their invaluable knowledge and also work towards promoting knowledge sharing, that organizational knowledge creation may take place. This is how such firms can greatly improve competency, work-quality, problem-solving efficiency, decision-making skills and individual or group performance as well as overall firm performance (see, for e.g., Alavi and Leidner; 1999; Salisbury, 2003; Syed-Ikhsan and Rowland, 2004; Yang, 2007).

In addition, there exists a significant relationship between the technological factor and one's knowledge sharing behavior, r = 0.569, p = 0.000 (see Table 7). That is, the results indicate a positive relationship between the two variables. Similarly, R^2 was computed in order to make a direct conclusion about the causality from the correlation analysis. The R^2 computed in this case equals 0.323 and this implies that the technological factor shares 32.3% of the variability in one's knowledge sharing behavior. The implication is that an increase or improvement in technology support will lead to an increase in one's knowledge sharing behavior. The results further show that there exists a relatively strong positive correlation between the technology factor of respondents and their knowledge sharing (r = 0.569, p = 0.000). Consequently, the researcher confirms the hypothesis of the study: *H2: Technology is positively associated with an individual's knowledge sharing behavior*. Hypothesis 2 (i.e., *H2*) is also supported, adding credence to the argument that technology is highly recognized as an enabler and facilitator among individuals and groups for the purpose of knowledge sharing (Hansen et al., 1999). The implication is that, a firm's investment in technology is more likely to ensure a free exchange of information and knowledge which may enable individuals to propose new ideas, exchange concepts, access data, overcome challenges and find solutions that are useful and beneficial to the firm.

Further, there is an indication of a significant relationship between the individual-level factors and knowledge sharing, r = 0.570, p = 0.000 (see Table 7). Thus, the results show a positive relationship between the individual-level factors and knowledge sharing. In this case, the R^2 computed equals 0.325 and this means that the individual-level factors shares 32.5% of the variability in the knowledge sharing behavior of a respondent. This implies that the higher the individual-level factors, the more positive knowledge sharing behavior will be for an individual.

The results also indicate that a relatively strong positive relationship exists between the individual-level factors and respondents' knowledge sharing behavior, r = 0.570, p = 0.000. On the basis of this analysis, the researcher confirms the hypothesis of the study: *H3: There is a positive relationship between Individual-level factors and knowledge sharing*.

The conclusion regarding hypothesis 3 (i.e., *H3*) is supported by previous studies that examined each of the components of the individual-level factors. Some studies found that interpersonal trust was necessary for knowledge sharing to take place within a firm (see Bakker et al., 2006; Issa and Haddad, 2008). Similarly, individual attitude towards knowledge sharing has been shown to have both direct and indirect effects on knowledge sharing (see, for e.g., Bock et al., 2005; Lin 2007c). Other studies also found that perceived benefits as well as an individual's self-efficacy were positively related to knowledge sharing (see, for e.g., Chiu et al., 2006; Lee et al., 2007). The findings support the notion that individuals assess the perceived ratio of benefits to costs and make their decisions to share knowledge or not based on the expectation that it will lead to rewards such as recognition, respect and extrinsic incentives (see, Emerson, 1981). It also adds credence to the argument that trust among people is critical for a successful knowledge sharing (see Bakker et al., 2006). Notice that the sharing of knowledge constitutes a major challenge in the field of KM due to some employees' resistance to share their knowledge with the rest of the firm. In practice, focusing on the individual-level factors that motivate and promote knowledge sharing would exert a strong influence on the formation of positive attitudes towards knowledge sharing.

The test results of this study have shown that, organizational, individual-level and technological factors positively affect an individual's knowledge sharing behavior. It turns out that high knowledge sharing among employees is likely attributed to the presence of factors such as trust in co-workers, management commitment and support, good leadership characteristic, informal incentives in the form of recognition by management and visibility within the firm, among others. This may, however, be compelled by positive organization-person influence, personal influence, and interpersonal influence. The results of this study show that organizational factors play a highly significant role in ensuring that knowledge sharing takes place in the workplace. Thus, management may first discover that organizational factors that seek to facilitate knowledge sharing and also provide the needed support, incentives and encouragement create an enabling

work environment for individuals to contribute towards organizational knowledge creation. In addition, such factors are more likely to strengthen organizational commitment and influence the individual-level factors such as trust in co-workers, resulting in strong knowledge sharing among employees. Management commitment towards organizational knowledge creation, couple with technology support may significantly affect knowledge sharing in the workplace.

Table 7. Correlation between organizational, individual-level and technological factors and knowledge sharing

Correlations

		Organizational factors	Individual-level factors	Technological factor	Knowledge sharing
Organizational factors	Pearson Correlation	1	.504**	.625**	.701**
	Sig. (2-tailed)		.000	.000	.000
	N	237	237	237	237
Individual-level factors	Pearson Correlation	.504**	1	.427**	.570**
	Sig. (2-tailed)	.000		.000	.000
	N	237	237	237	237
Technological factor	Pearson Correlation	.625**	.427**	1	.569**
	Sig. (2-tailed)	.000	.000		.000
	N	237	237	237	237
Knowledge sharing	Pearson Correlation	.701**	.570**	.569**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	237	237	237	237

**. Correlation is significant at the 0.01 level (2-tailed).

4.6 Regression Analysis

Regression analyses were performed to establish the relationship the organizational, individual-level and technological factors and knowledge sharing. First of all, the researcher assumed that all the necessary assumptions (additivity and linearity, independent errors, normally distributed errors, homoscedasticity, non-zero variance) have been met when carrying out these analyses.

Notice that a significant relationship have been found to exist between the organizational, individual-level and technological factors and knowledge sharing (as evident in Table 8). From the model summary table (see Table 8), it was observed that R equals 0.756 which is equal to the simple correlation between the organizational, individual-level and technological factors and knowledge sharing. R^2 computed equals 0.571 (i.e., 57.1%). Using F-ratio = 103.311 (Sig. = 0.000) from the ANOVA table (see Table 9), it can be concluded that the regression model overall predict knowledge sharing behavior significantly well.

The regression output provides estimations of the model's parameters with their rate of significance (see Table 10). From the slope of the regression line, it can be inferred that, if the independent variable (i.e., organizational factors) score is increased at 1, then, the model predicts that, knowledge sharing behavior will be improved or increased in average with 0.244 (B = 0.244, Sig. = 0.000) holding all other variables constant. Similarly, if the individual-level or technological factor(s) score is increased at 1, then, the model predicts that, knowledge sharing behavior will be improved or increased in average with 0.141 (B =0.141, S. = 0.000) or 0.245 (B = 0.245, Sig. = 0.003) respectively holding all other variables constant. This implies that higher values on the independent variables tend to go together with higher values on the dependent variable. It can also be observed that, the model has a weak effect on knowledge sharing (Beta = 0.464, 0.266, 0.165 for organizational, individual-level and technological factors respectively).

Table 8. Model Summary for regression (Relationship between organizational, technological and individual-level factors and knowledge sharing)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756[a]	.571	.565	2.11500

a. Predictors: (Constant), Technological factor, Individual-level factors, Organizational factors

Table 9. ANOVA (Relationship between organizational, technological and individual-level factors and knowledge sharing)

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1386.401	3	462.134	103.311	.000[b]
	Residual	1042.266	233	4.473		
	Total	2428.667	236			

a. Dependent Variable: Knowledge sharing

b. Predictors: (Constant), Technological factor, Individual-level factors, Organizational factors

Table 10. Regression Coefficient (Relationship between organizational, technological and individual-level factors and knowledge sharing)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.777	1.500		-1.851	.065		
	Organizational factors	.244	.031	.464	7.950	.000	.541	1.850
	Individual-level factors	.141	.027	.266	5.276	.000	.725	1.379
	Technological factor	.245	.083	.165	2.961	.003	.592	1.688

a. Dependent Variable: Knowledge sharing

The results show that there exists a significant relationship between the organizational and technological factors and the individual-level factors (see Tables 11, 12). Thus, when individual-level factors was set as the dependent variable, the results indicate that organizational factors predict the individual-level factors, r = 0.504, p = 0.0000 (see Table 11). In this case, R^2 equals 0.254 (25.4%). The regression output provides estimations of the model's parameters with their rate of significance (see Table 13). From the slope of the regression line, it can be inferred that, when the organizational factors variable increases with 1 unit, the individual-level factors variable will increase in average with 0.499 (B = 0.499, Sig. = 000). The model also has a pretty

strong effect on the individual-level factors (Beta = 0.504). Similarly, the results show that the technological factor predicts the individual-level factors, r = 0.427, p = 0.000 (see Table 12). Here, R^2 equals 0.1824 and therefore, shows that technological factor shares 18.24% of the variability in the individual-level factors. From the slope of the regression line, the results indicate that when the technological factors is increased with 1 unit, the individual-level factors variable will increase in average with 1.193 (B = 1.193, Sig. = 000). The results also show that the effect of the technological factor on the individual-level factors is fairly weak (Beta = 0.427) (see Table 14).

Table 15 further indicates that there exists a relationship between the technological factor and the individual-level factors, after controlling for the organizational factors, (i.e., B = 0.385, 0.514 and Beta = 0.389, 0.184) for organizational and technological factors respectively. On the basis of these results, the researcher confirms the hypothesis of the study: *H6: Organizational and technological factors predict individual-level factors to share knowledge*. This implies that both organizational and technological factors conducive to knowledge sharing exert a strong influence on the formation of individual-level factors regarding an individual's knowledge sharing behavior. In practice, encouraging employees, creating an enabling environment, putting in place support systems, as well as informal incentives in the form of recognition by management and visibility within the firm can often be a more powerful motivation for organizational members to share knowledge. This is deemed a critical step for organizational knowledge creation to take place.

Table 13. Regression Coefficient (Relationship between organizational factors and individual-level factors)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.582	3.088		10.229	.000
	Organizational factors	.499	.056	.504	8.944	.000

a. Dependent Variable: Individual-level factors

Table 14. Regression Coefficient (Relationship between technological factors and individual-level factors)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	42.593	2.298		18.537	.000
	Technological factor	1.193	.165	.427	7.241	.000

a. Dependent Variable: Individual-level factors

Table 15. Regression Coefficient (Relationship between technological factor and individual-level factors, controlling for organizational factors)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	30.765	3.067		10.029	.000
	Organizational factors	.385	.071	.389	5.453	.000
	Technological factor	.514	.199	.184	2.579	.011

a. Dependent Variable: Individual-level factors

4.7 Mediation Analysis

After conducting a series of multiple regression, mediation analysis was performed to test the association, between the organizational factors and knowledge sharing as well as, between technological factor and knowledge sharing (in both cases, being mediated by individual-level factors. The mediation test proposed by Preacher and Hayes (2008) was used to test such association, if any, in this study. The authors have shown that, (a-path * b-path) = c-path - c'-path, where a, b, c, and c' are the slope coefficients between the variables being investigated. They assumed that the independent and mediation variables are continuous. Thus, if a-path*b-path (i.e., "the indirect effect") is statistically significant, mediation has occurred. Moreover, percent mediation (P_M) which is given as: a-path*b-path / c-path indicates the percent of the total effect (i.e., c-path) accounted for by the indirect effect (i.e., a-path*b-path).

Preacher and Hayes (2008) illustrate the mediation test as follows:

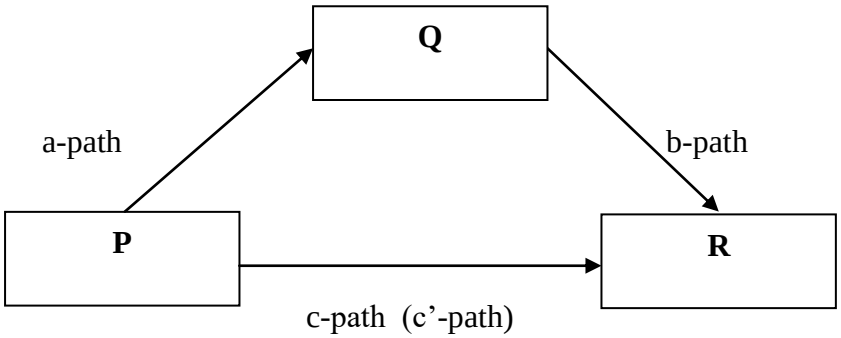

Figure 3. Mediation test (adopted from Preacher and Hayes, 2008)

The mediation analysis was performed using the process macro in SPSS. The results of the analyses indicate that there is evidence of mediation between the organizational factors and knowledge sharing (being mediated by the individual-level factors). Thus, there was a significant indirect effect of the organizational factors on knowledge sharing behavior, through the individual-level factors, a-path = 0.4992, b-path = 0.1542, a-path*b-path = 0.077, c'-path= 0.292, c-path = 0.369, P_M = 0.209 (see Tables 11). The mediator could account for approximately 20% of the total effect, P_M = 0.209. Similarly, Analysing the results of Table 12, the researcher observed that there exists a significant indirect effect of the technological factor on knowledge sharing behavior, through the individual-level factors. The results were as follows: a-path = 1.1931, b-path = 0.2124, a-path*b-path = 0.2534, c'-path= 0.5896, c-path = 0.843, P_M = 0.301 (see Tables 12). Thus, there is evidence of mediation between the technological factor and knowledge sharing (being mediated by the individual-level factors) and the mediator could account for about 30% of the total effect, P_M = 0.301.

Based on the mediation analysis, the researcher confirms the hypotheses of the study: *H4: Individual-level factors will mediate the relationship between organizational factors and knowledge sharing;* and *H5: Individual-level factors will mediate the relationship between technological factor and knowledge sharing*. Evidence of the mediation between the organizational factors and knowledge sharing as well as between the technological factor and knowledge sharing (being mediated by the individual-level factors) is depicted in figure 4. The implication of this is that, both organizational and technological factors conducive to knowledge sharing exert a strong influence on the formation of individual-level factors regarding an individual's knowledge sharing behavior. However, the indirect influence of the technological factor regarding knowledge sharing is relatively stronger than that of the organizational factors.

By surfacing the key motivational drivers associated with individuals' knowledge sharing behaviors and providing evidence regarding the efficacy of these factors have practical implications for SMEs. Unlike large firms, access to finance and limited scare resources pose a major challenge for the international expansion of SMEs. Thus, the limited tangible resource capacity of SMEs makes organizational knowledge and its efficeient management critical to the success and survival of such firms in the highly dynamic and competitive international market (Kogut and Zander, 1992; Grant, 1996). Likewise, many scholars have argued that a firm's ability to manage knowledge resources, in this case, organizational knowledge largely affects: 1) the international expansion of those firms (Miller and Shamsie 1996; Yli-Renko et al., 2002; Wiklund and Shepherd, 2003; Saarenketo et al., 2004); 2) the achievement of sustainable competitive advantage (Kogut and Zander, 1992; Grant, 1996; Davenport et al., 1998; Pan and Scarbrough, 1999; Alavi and Leidner, 2001). This means that, generally, SMEs must also provide employees with IT infrastructures and encourage as well as ensure that they use these infrastructures to create, store and share their knowledge. The knowledge toolkits part of the IT infrastructures should further be perceived as simple and easy to use as well as adding value to the employees' output or performance. This way, more if not all employees would be willing and able to share truly valuable knowledge with colleagues and the firm.

This thesis however, suggests that the sharing of knowledge in general among multiple individuals with different background, experiences, perspectives, and motivations with the ultimate aim of creating organizational knowledge is better positioned to succeed in the international market. The suggestion is based on the following ideas: 1) there is recognition and a common view among scholars and researchers that knowledge resources are necessary for the internationalization of SMEs (Yli-Renko et al., 2002; Wiklund and Shepherd, 2003; Saarenketo et al., 2004); 2) the success of SMEs can be linked to how effective and efficient they manage their existing knowledge and new knowledge (Dollinger, 1984; Brush 1992); 3) the ability to effectively apply existing knowledge to create more knowledge is what helps firms to grow and achieve sustainable competitive advantage in the marketplace (Pan and Scarbrough, 1999; Alavi and Leidner, 2001); and 4) the success of KM initiatives depends on knowledge sharing (Wang and Noe, 2010). This implies that, KM is an integral part of the internationalization process of SMEs.

This study acknowledges that the findings must be interpreted in light of its limitations. First, data collection was limited to SMEs in Norway and thus, the findings should not be interpreted as necessarily applicable to large firms or firms in distinctly different national cultures. Second, as the data used in the analysis were cross-sectional and not longitudinal, the posited causal relationships (even though firmly based on generall accepted theories and also supported in previous studies) may only be inferred rather than proven. Finally, the study might have overlooked some key motivating factors and failed to account for barriers of knowledge sharing acknowledged in literature. Given these limitations, it is strongly recommended that others examine the findings through more rigorous research designs and across different national cultures.

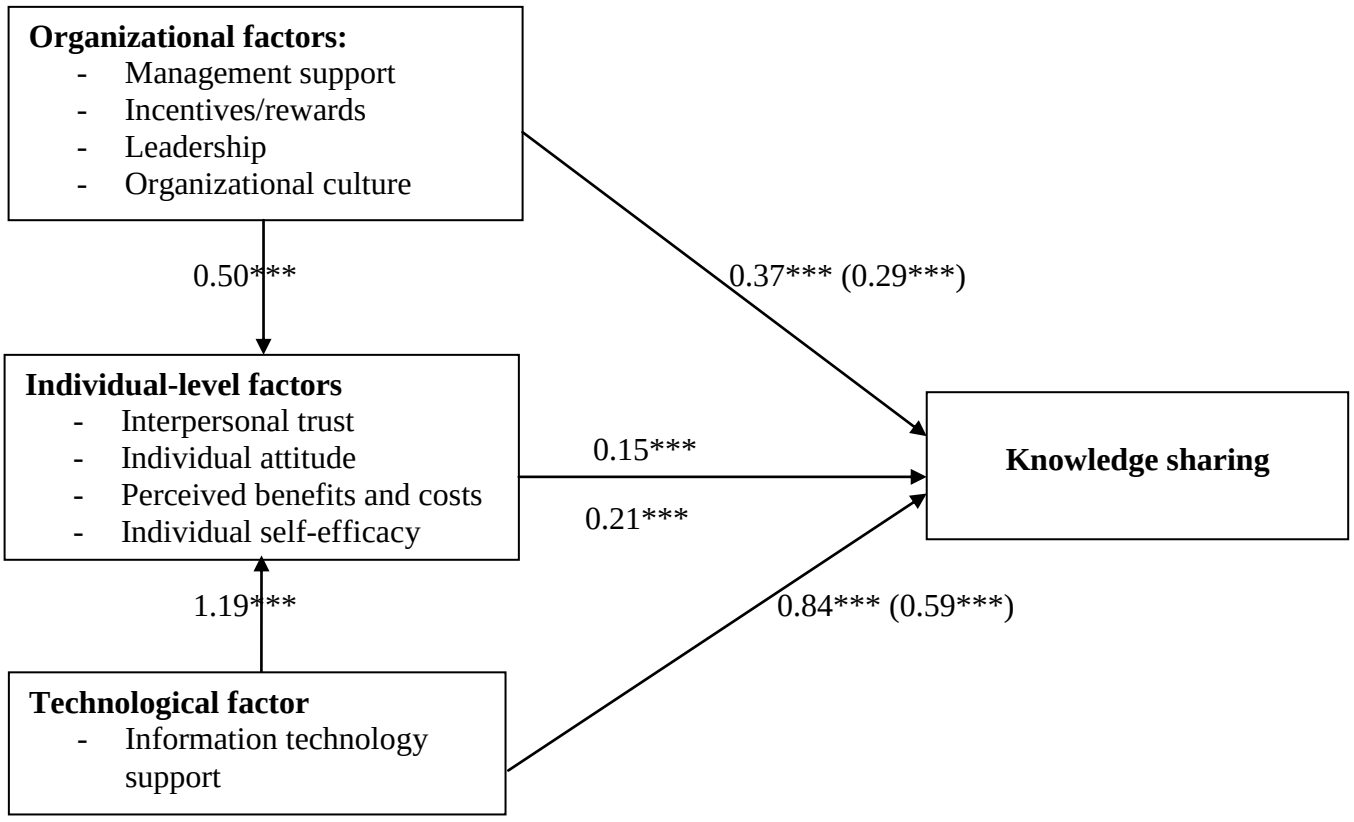

Figure 4: A proposed model of knowledge sharing

Table 11. Mediation analysis (Relationship between organizational factors and knowledge sharing, mediated by individual-level factors)

```
Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.3 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 4
    Y = K_S
    X = Org_F
    M = Ind_L_F

Sample size
        237

**************************************************************************
Outcome: Ind_L_F

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .5039      .2540    27.3806   106.4255     1.0000   235.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant   31.5821     2.7704    11.4000      .0000    26.1242    37.0400
Org_F        .4992      .0484    10.3163      .0000      .4038      .5945

**************************************************************************
Outcome: K_S

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .7448      .5547     4.6217   168.7450     2.0000   234.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant   -2.8038     1.3773    -2.0357      .0429    -5.5173     -.0903
Ind_L_F      .1542      .0267     5.7684      .0000      .1016      .2069
Org_F        .2916      .0296     9.8439      .0000      .2332      .3499

************************** TOTAL EFFECT MODEL ****************************
Outcome: K_S

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .7012      .4917     5.2533   235.4229     1.0000   235.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant    2.0672     1.3519     1.5291      .1276     -.5963     4.7306
Org_F        .3686      .0240    15.3435      .0000      .3212      .4159
```

```
***************** TOTAL, DIRECT, AND INDIRECT EFFECTS ********************

Total effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
      .3686      .0240    15.3435      .0000      .3212      .4159

Direct effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
      .2916      .0296     9.8439      .0000      .2332      .3499

Indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .0770      .0147      .0514      .1090

Partially standardized indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .0240      .0044      .0163      .0335

Completely standardized indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .1465      .0269      .0994      .2051

Ratio of indirect to total effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .2089      .0437      .1353      .3052
Ratio of indirect to direct effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .2640      .0728      .1565      .4393

R-squared mediation effect size (R-sq_med)
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .2621      .0371      .1904      .3363

Normal theory tests for indirect effect
     Effect         se          Z          p
      .0770      .0153     5.0169      .0000

****************** ANALYSIS NOTES AND WARNINGS ************************

Number of bootstrap samples for bias corrected bootstrap confidence
intervals:
     5000
Level of confidence for all confidence intervals in output:
    95.00

NOTE: All standard errors for continuous outcome models are based on the HC3
estimator

NOTE: Kappa-squared is disabled from output as of version 2.16.

NOTE: K_S stands for knowledge sharing
      Org_F stands for organizational factors
      Ind_L_F stands for individual-level factors

------ END MATRIX -----
```

Table 12. Mediation analysis (Relationship between technological factors and knowledge sharing, mediated by individual-level factors)

```
Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.3 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 4
    Y = K_S
    X = Tech_F
    M = Ind_L_F

Sample size
        237

**************************************************************************
Outcome: Ind_L_F

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .4271      .1824    30.0068    68.4168     1.0000   235.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant    42.5928     2.1118    20.1688      .0000    38.4323    46.7533
Tech_F       1.1931      .1442     8.2714      .0000      .9089     1.4773

**************************************************************************
Outcome: K_S

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .6741      .4544     5.6623   143.9940     2.0000   234.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     1.6708     1.2875     1.2978      .1956     -.8657     4.2074
Ind_L_F       .2124      .0295     7.2104      .0000      .1544      .2705
Tech_F        .5896      .0902     6.5379      .0000      .4119      .7672

************************** TOTAL EFFECT MODEL ****************************
Outcome: K_S

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .5687      .3234     6.9925    97.4969     1.0000   235.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant    10.7195     1.2426     8.6265      .0000     8.2714    13.1676
Tech_F        .8430      .0854     9.8741      .0000      .6748     1.0112
```

```
***************** TOTAL, DIRECT, AND INDIRECT EFFECTS ********************

Total effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
      .8430      .0854     9.8741      .0000      .6748     1.0112

Direct effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
      .5896      .0902     6.5379      .0000      .4119      .7672

Indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .2535      .0407      .1818      .3420

Partially standardized indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .0790      .0114      .0587      .1034

Completely standardized indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .1710      .0263      .1249      .2286

Ratio of indirect to total effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .3007      .0550      .2070      .4241
Ratio of indirect to direct effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .4299      .1204      .2610      .7365

R-squared mediation effect size (R-sq_med)
            Effect    Boot SE   BootLLCI   BootULCI
Ind_L_F      .1941      .0367      .1266      .2735

Normal theory tests for indirect effect
     Effect         se          Z          p
      .2535      .0468     5.4128      .0000

****************** ANALYSIS NOTES AND WARNINGS ************************

Number of bootstrap samples for bias corrected bootstrap confidence
intervals:
     5000
Level of confidence for all confidence intervals in output:
    95.00

NOTE: All standard errors for continuous outcome models are based on the HC3
estimator

NOTE: Kappa-squared is disabled from output as of version 2.16.

NOTE: K_S stands for knowledge sharing
      Org_F stands for organizational factors
      Ind_L_F stands for individual-level factors

------ END MATRIX -----
```

Chapter five

Summary and conclusion

5.1 Overview

This chapter presents the summary and conclusion of the study. It includes the overall summary and conclusion of the study as well as implications of the study. It also discusses suggestion for further research.

5.2 Summary and conclusion

The ultimate objective of the study has been to add to the collective understanding of factors likely to underlie individuals' attitudes toward and intentions regarding knowledge sharing behaviors. Accordingly, the study identified a number of potentially salient factors and developed a model that classifies these key factors into three dimensions, namely organizational, individual-level and technological factors) to investigate whether these factors being adopted in existing literature can explain an individual's knowledge sharing behavior. The study applied these as antecedents to knowledge sharing behavior and modified the model to analyse the mediation effect between the factors and knowledge sharing behavior, using sampled employees and managers of randomly selected SMEs in Norway. Overall, the model supported the relationships posited in the conceptual model of knowledge sharing through a survey of employees and senior managers who are the key participants and decision-makers regarding knowledge sharing within these firms. In particular, the following findings provide important insights in understanding why people choose to or not to engage in knowledge sharing.

From the results of the study, it can be noted that the response rate was very high, representing 94.8% of the distributed questionnaires (i.e., 237 out of 250 respondents). The statistical reliability of variables measured based on Cronbach's Alpha was about 85.9%, thus, making the results highly representative. The results showed that all the predictor vaiables (i.e., the organizational, technological and individual-level factors) have a positive relationship with knowledge sharing behavior. The relationships are statistically significant. The influence of the predictor variables on knowledge sharing behavior was slightly high (57.1%). Considering the relationship between each of the predictor variables and knowledge sharing behavior, it can be

observed that, the organizational factors have relatively the strongest positive relationship with knowledge sharing behavior (r = 0.701). The individual-level factors enjoy a relatively stronger positive relationship with knowledge sharing behavior (r = 0.570). Meanwhile, the technological factor has a relatively strong positive relationship with knowledge sharing behavior (r = 0.569). However, the conclusion on the relationship between the predictor variables and knowledge sharing behavior is consistent with the findings of other previous studies in the literature view (see, for e.g., Levin, 1999; Bock et al., 2005; Lee et al., 2006; Sabatier and Nelson, 2006; Al-Alawi et al., 2007; Kerr and Clegg, 2007; Lin 2007; Wang and Noe, 2010).

The study also showed that, both organizational and technological factors predict the individual-level factors to share knowledge. The influence is however slightly low (i.e., 27.5%). From the results of the study, it can be observed that, organizational factors enjoy a relatively stronger positive relationship with the individual-level factors to share knowledge (r = 0.504) and the technological factor has a relatively moderate positive relationship with the individual-level factors to share knowledge (r = 0.427). The results further indicated that there is evidence of mediation between the organizational factors and knowledge sharing behavior as well as the technological factor and knowledge sharing behavior (with individual-level factors as the mediation variable). The mediator variable (i.e., the individual-level factors) could account for approximately 20% and 30% of the total effect, in case of the organizational and technological factors respectively. The study concluded that there was a significant indirect effect of both the organizational and technological factors on knowledge sharing behavior, through the individual-level factors. It also concludes that the model overall predict knowledge sharing behavior significantly well. Finally, the results obtained confirm all the research hypotheses formulated to guide the study. Notice that, the items included to measure the variables of interest used in the analysis can be separated into a clear dimension and can however be inferred that, the items were related. The proposed model of knowledge sharing argues that knowledge sharing is influenced by the organizational, individual-level and technological factors.

5.3 Implications of the study

Knowledge is an essential organizational resource that provides a sustainable competitive advantage in a highly competitive and dynamic economy (see, for e.g., Grant, 1996, Davenport

and Prusak, 1998). SMEs must therefore consider how to promote the sharing of knowledge and expertise between experts who possess it and novices who need to know. Thus, they need to emphaisze and more effectively exploit knowledge-based resources that already exist with the firm. A key issue for the failure of any KM initiative to facilitate knowledge sharing is the lack of consideration of how the organizational and interpersonal context as well as individual characteristics influence knowledge sharing behaviors (see Cater and Scarbrough, 2001).

SMEs in most cases, fail to achieve sustainable competitive advantage in the international market because they are not able to manage their knowledge resources effectively and efficiently in the internationalization process (Rodriguez et al., 2010). This makes it practically important to investigate how such firms may facilitate the process of knowledge sharing to ensure a successful KM initiative aimed at creating organizational knowledge. For instance, when managers understand the mechanism that drives organizational members to contribute their invaluable knowledge and work towards promoting knowledge sharing, then organizational knowledge may be created. This presents a high possibility for SMEs to significantly improve competency, work-quality, problem-solving efficiency, decision-making skills and individual or group performance as well as overall firm performance.

In addition, management commitment towards organizational knowledge creation and the firm's investment in technology to ensure a free exchange of information and knowledge is critical for a successful internationalization of SMEs. This is because it facilitates and ensures that individuals are able to propose new ideas, exchange concepts, access data, overcome challenges and find solutions that are useful in securing the success and survival of SMEs in the highly dynamic and competitive international market. It has been established in the literature that, SMEs' ability to manage knowledge resources largely affects the international expansion of those firms and also help them gain sustainable competitive advantage. This study supports the notion that sharing of knowledge in general among multiple individuals (within and across SMEs) with different background, experiences, perspectives, and motivations with the utmost aim of creating organizational knowledge is better positioned to succeed in the international market.

Effective knowledge sharing required for a successful KM initiative cannot be forced or mandated. Management of SMEs desiring to institutionalized knowledge sharing behaviors must

foster facilitative work contexts. By surfacing the key motivational drivers associated with individuals' knowledge sharing behaviors and providing evidence regarding the efficacy of these factors have practical implications for SMEs, this thesis have contributed to the development of a richer understanding of what needs to be done in order to create such facilitative work contexts. In light of the increasing importance of knowledge sharing in today's world and even more so in the future, it is expected that the findings of this study would be useful to readers and other researchers engaged in similar studies aimed at enriching our collective understanding regading knowledge sharing within and across firms. The study proposes that, SMEs must provide employees with IT infrastructures and encourage as well as ensure that they use these infrastructures to create, store and share their knowledge. For example, the knowledge toolkits part of the IT infrastructures should further be perceived as simple and easy to use as well as adding value to the employees' output or performance. This way, more if not all employees would be willing and able to share truly valuable knowledge with colleagues and the firm.

5.4 Suggestion for further research

First of all, it is expected that the findings of this study would serve as a basis for further research on knowledge sharing within a firms. There are many factors that influence knowledge sharing behavior within an organization. This study selected nine (9) elements and grouped them into three (3) based on their commonality. The analyses of this study was limited to these three (3) broad factors (i.e., organizational, individual-level and technological factors). The study was further limited to SMEs in Norway. Given these limitations, I strongly encourage other researchers to examine the findings of this study through more rigorous research designs and across different national cultures. In addition, further studies is needed to: 1) analyse each component of the broad factors; 2) examining knowledge sharing beyond the boundaries of individual firms, reflecting the increasing importance for employees within the firms to share knowledge with business partners, suppliers, customers); 3) examine the sharing of specific kinds of knowledge assets; and 4) examine other factors not included in this study. It is also the researcher's recommendation to extend the study to include large firms to confirm the findings or bring forth new findings. This study further suggests for continued research on knowledge sharing by introducing different context of the questions/statements and ask more questions.

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Appendix A

Questionnaire

I am a student of Bodø Graduate School of Business and conducting a research to analyse the key antecedents of knowledge sharing among SMEs. This is purely an academic research and you will be kept anonymous. I humbly request you to co-operate with me with your honest response.

1. **Gender:** □ Male □ Female
2. **Age Group:** □ Under 20 □ 20-25 □ 26-30 □ 31-35 □ Above 35
3. **City** □ Tromsø □ Bodø □ Other

Please consider the following scale and fill remaining questionnaire accordingly.

1 – Strongly Disagree	2 – Disagree	3 – Neutral	4 – Agree	5 – Strongly Agree

Organizational factors								
	Item	**Statement**	**1**	**2**	**3**	**4**	**5**
Management Support	1	I have a work manual which is updated from time to time					
	2	I am given time and/or access to our firm's web portal for knowledge sharing					
	3	We do not have regular meetings to address challenges and/or share ideas and knowledge about work, projects, etc.					
	4	I am mandated to put in writing (i.e., document) my tasks and the steps/procedure I go through in getting the task done					
Incentives/rewards	5	My firm recognizes employees for their role in knowledge sharing					
	6	My firm does not reward better performance of individuals					
	7	My firm pays for the cost of employee's professional development or training					
	8	I do not receive a clap offering, a souvenir or a special package for sharing new ideas, expertise or knowledge during meetings					
Leadership	9	The leadership of the firm has the ability to inspire and gain the most from us (i.e., employees)					
	10	The skills, behaviors and attitudes of our leaders are not appropriate for the firm					
	11	The management of the firm is flexible that they support the individual (i.e., employee)					
	12	The management of the firm organizes workshops or seminars for employees on a regular basis					

Organizational culture	13	I find that co-workers do not like to share their personal experience, expertise and ideas					
	14	I find that my values and the firm's values are similar					
	15	I am informed of any changes in my work or projects that I am involved in before implementation					
	16	My firm has a clearly articulated mission and vision statement which is translated into behavioral standards and communicated across the firm so that employees know what is expected of them					

Individual-level factors							
	Item	**Statement**	**1**	**2**	**3**	**4**	**5**
Interpersonal trust	17	I do not consider my co-workers as people who are trustworthy					
	18	I can count on my co-workers to do what is right, even if not monitored					
	19	I consider my co-workers as people who can be trusted					
	20	I can not count on my co-workers to get the job done right					
Individual attitude	21	Sharing of knowledge with co-workers has not always been an enjoyable experience					
	22	I feel good about sharing my expertise and experience with co-workers					
	23	I do not share my expertise or knowledge wholeheartedly					
	24	I like sharing my knowledge with co-workers					
Perceived benefits/costs	25	Sharing knowledge with co-workers would not improve my personal development					
	26	Sharing knowledge with co-workers would enhance my personal reputation					
	27	Sharing knowledge with co-workers would strengthen our relationship					
	28	Sharing knowledge with co-workers would earn me recognition and respect					
Individual self-efficacy	29	I can perform my duties at work with little or no coordination with others					
	30	I frequently perform my tasks without consulting others					
	31	I do not have to ask for help in order to do my job					
	32	I work fairly independently of others at my job					

Technological factor							
	Item	**Statement**	**1**	**2**	**3**	**4**	**5**
Information technology support	33	The information technology support of my firm is not adequate					
	34	The information technology support of my firm makes me share knowledge with ease					
	35	The information technology support of my firm has not always made knowledge sharing an enjoyable experience					
	36	The information technology support of my firm makes knowledge easily accessible					

Knowledge sharing							
	Item	**Statement/Question**	**1**	**2**	**3**	**4**	**5**
Knowledge sharing	37	I always want to share my expertise, experience and ideas with co-workers					
	38	I do not share my knowledge at the request of my co-workers					
	39	I often use informal interaction to share knowledge					
	40	I often share different types of knowledge, such as personal experience, expertise or ideas with co-workers					
	41	I often use the firm's database to share knowledge					
	42	I do not have the intention of sharing my expertise, knowledge or experience with co-workers					

Appendix B

Definitions of the variables used in this study

Variables		Definitions	Key references
Organizational factors	Management support	The perception that top managers understand the importance of knowledge sharing and facilitate as well as enhance one's knowledge sharing	Lee et al. (2006); Wang and Noe (2010)
	Incentives/ reward	The degree to which one may receive extrinsic and/or intrinsic incentives for one's knowledge sharing	Bock et al. (2005); Sabatier and Nelson (2006); Wang and Noe (2010)
	Leadership	The perception that leaders and their leadership styles are desirable, flexible and inspiring for influencing one's knowledge sharing	Leithwood et al. (1999); Jong and Hartog (2007); Kerr and Clegg (2007)
	Organizational culture	The perception that a firm's values and ways of doing things encourage one's knowledge sharing	Connelly and Kelloway (2002); AL-Alawi et al. (2007); Kerr and Clegg (2007)
Individual-level factors	Interpersonal trust	The perception that individuals and/or team members can be trusted	Levin (1999); Cheng, Yeh and Tu (2008); Andrews and Delahay (2000); Al-Alawi et al. (2007); Wang and Noe (2010)
	Individual attitude	The degree of one's positive feelings about sharing one's knowledge	Bock and Kim (2002); Bock et al. (2005); Wang and Noe (2010)
	Perceived benefits /costs	The degree to which one believes that one will gain/loss respect, recognition, reputation or better relationship with others through one's knowledge sharing	Emerson (1981); Bock et al. (2005); Chiu et al. (2006); Wang and Noe (2010)
	Individual self-efficacy	The degree of one's cognition based on one's ability to perform a specific task (through knowledge sharing)	Bandura (1997); Lee et al. (2007)

Technological factors	Information technology support	The degree to which one believes that IT application can improve personal and overall performance through one's knowledge sharing	Hansen et al. (1999); Handzic and Hasan (2003);
Dependent variable of interest	Knowledge sharing	The degree and extent to which, as well as the frequency with which one engages in knowledge sharing through a or (different) channel(s)	Alavi and Leidner (1999); Salisbury (2003); Cheng et al. (2009); Wang and Noe (2010); Islam et al (2011)

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